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PUBLIC OPINION ON ENVIRONMENTAL PROBLEMS AND PROGRAMS IN MASSACHUSETTS

Findings from the Spring 1989 DEQE Massachusetts Household Survey

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Final Report of the Public Opinion Survey Project in furtherance of a contract with the Massachusetts Department of Environmental Protection (formerly the Massachusetts Department of Environmental Quality Engineering).

Additional copies of this report may be purchased from The Environmental Institute, Blaisdell House, University of Massachusetts, Amherst, MA 01003

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Throughout this report, we discuss public attitudes and perceptions concerning the Massachusetts Department of Environmental Quality Engineering (DEQE). As this report was being prepared for final publication, Michael Dukakis, the Governor of Massachusetts, signed into law legislation officially changing the DEQE to The Department of Environmental Protection (See State Law: STAT. 1989,c. 240. 101,). All references to the DEQE in this report, therefore, refer as well to the Department of Environmental Protection.

Table Of Contents

List Of Tables iii

ABSTRACT v

EXECUTIVE SUMMARY vi

Chapter 1 1
  The Origins of the DEQE Household Survey 2

Chapter 2 Characteristics of Survey Respondents 8
  Sample Demographic Characteristics and Representativeness 9
  Household Composition. 13
  Socio-Economic Indicators. 15
  DEQE Region 18

Chapter 3 Environment-Related Household Practices 20
  Introduction 20
  Household Water Supply 20
  The Handling of Domestic Sewage 23
  Trash Disposal 26
  Disposing of Building Materials 28
  Disposing of Crankcase Oil 31
  Disposing of Household Paints and Thinners 33
  Household Waste Recycling Practices 35
  Recreational Environmental Use Patterns 38
  Proximity to Undesirable Land Uses 40

Chapter 4 The Perceived Seriousness of Local and State Environmental Problems 42
  Introduction 42
  On the Meaning of "Seriousness" 43
  The Perceived Quality of Domestic Water 51
  The Most Pressing Environmental Problems 53
  Respondent Variation in Seriousness 56
  Local Environmental Problems. 56
  State Environmental Problems 63
  The Seriousness of Combined State and Local Problems 68

Chapter 5 Popular Views of DEQE and Environmental Programs 72
  Introduction: 72
  Recognition of DEQE 73
  Who Knows About DEQE? 77
  Awareness of DEQE Programs 82
  Determinants of DEQE Program Knowledge 85
  Assessment of Program Performance 89
  Holding Opinions on Program Performance 92
  The Determinants of Program Performance Ratings 97

Chapter 6 Popular Support for Environmental Programs 102
  Introduction 102
  Support for Environmental Programs 102
  Nation-wide Public Opinion on Support for Environmental Programs 105
  Holding Opinions on Support for Environmental Programs 110
  Who Supports Increases in the State Environmental Effort? 115

Chapter 7 Suggestions for Future Research 119
  Periodic Indicator Studies. 120
  Special Studies 121
  Vulnerability 121
  Perceived Impact 121
  Program Effort 122
  Priority Studies. 122

Appendix A Survey Questionnaire and Overall Findings 124

List Of Tables

Table 1.1: Sample Fulfillment Experience 7
Table 2.1: County Distribution of DEQE Sample and of 1980 Census. 10
Table 2.2: Selected Sample Demographic Characteristics 12
Table 2.3: Selected Sample Demographic Characteristics 14
Table 2.4: Work Status and Income 17
Table 2.5: Respondents' Region Of Residence 19
Table 3.1: Household Water Supply 22
Table 3.2: Sewage Disposal Methods 25
Table 3.3: Trash Disposal Methods 27
Table 3.4: Disposal Last Year of Building Materials and Scraps 30
Table 3.5: Disposal of Crankcase Oil 32
Table 3.6: Disposal of Household Paints and Thinners 34
Table 3.7: Presence and Use of Recycling Programs 37
Table 3.8: Recreational Environmental Use 39
Table 3.9: Undesirable Nearby Land Uses (Percent with Uses within Half Mile of Residence) 41
Table 4.1: Perceived Seriousness of Local and State Environmental Problems 47
Table 4.2: Levels of Concern with Environmental Problems Registered in Recent National Surveys 49
Table 4.3: Perceived Quality of Drinking Water Taste 52
Table 4.4: Perceived Main Environmental Problem Facing Local Communities and Facing the State 55
Table 4.5: Average Opinions Held on the Local Environmental Problems and Their Perceived Seriousness by DEQE Region 58
Table 4.6: Regressions of Holding Opinions on the Local Environmental Problems and Their 62
Table 4.7: Average Opinions Held on the State Environmental Problems and Their Perceived Seriousness For DEQE Regions 64
Table 4.8: Regressions on Holding Opinions on the State Environmental Problems and Their Perceived Seriousness 67
Table 4.9: Average Environmental Seriousness For DEQE Regions 69
Table 4.10: Regression of Perceived Seriousness of Combined State and Local Environmental Problems 71
Table 5.1: Knowledge of DEQE and Sources of Knowledge 75
Table 5.2: Knowledge of DEQE by DEQE Regions 78
Table 5.3: Regression of Knowledge of DEQE Agency 81
Table 5.4: Knowledge About DEQE Programs and of DEQE Sponsorship of those Programs 84
Table 5.5: Knowledge of DEQE And State Programs by DEQE Regions 86
Table 5.6: Regression of Knowledge of DEQE and State Programs on Selected Respondent 88
Table 5.7: Ratings of How well the State is doing in Dealing with Six Environmental Issues: 91
Table 5.8: Number of Opinions on DEQE Program Performance by DEQE Regions . . . 93

Table 5.9: Regression of Knowledge Concerning State Environmental Program Performance 96
Table 5.10: Favorable Rating of DEQE Program Performance by DEQE Regions 98
Table 5.11: Regression of Favorable Ratings of DEQE Environmental Programs 101
Table 6.1: Support for Environmental Protection Programs 104
Table 6.2: National Survey Data on Environment Protection Support: 1984-1988. 109
Table 6.3: Holding of Opinions on Environmental Program Support: DEQE Regions ... 111
Table 6.4: Regression on Environmental Program Support Opinion Holding 114
Table 6.5: Average Level of Support for Environmental Program by DEQE Regions 116
Table 6.6: Regression of Support for Environmental Programs 118

ABSTRACT

Based on a random sample of Massachusetts telephone owning households, this survey reports on how the citizens of Massachusetts view the seriousness of environmental problems facing the state, their knowledge of the Department of Environmental Quality Engineering, their approval for that agency's programs and their willingness to provide further support for the programs. Main findings are: 1) State environmental problems are viewed as serious by solid majorities. 2) Eight of ten citizens know of the DEQE. 2) Most DEQE programs are recognized but few attribute the programs to DEQE. 3) Most believe that the state environmental programs are doing poorly or only "fair" in dealing with environmental problems. 4) Solid popular support exists for increased support of environmental protection programs and increased regulation of environmental hazards. 5) The high level of criticism of environmental programs arises because they are believed to be inadequately implemented in the light of the very serious environmental problems faced by the state.

EXECUTIVE SUMMARY

Every program in which the Department of Environmental Quality Engineering (DEQE) is involved affects directly and indirectly many segments of the citizenry of Massachusetts. In turn, the proper running of the programs often depend directly or indirectly on public support. Whether the program in question concerns the long range effects of environmental toxins, public education and training in water resource management or waste reduction, or the remediation of environmental accidents, each action taken by DEQE potentially relies on and affects public consciousness and/or approval. It is the recognition of the close interplay between DEQE policy and public knowledge and support that lies behind the research findings related in this report.

How the citizens of our Commonwealth regard the state's environmental problems and the programs dedicated to meet them is the main concern of the survey findings described in this report. The primary issues addressed in the survey include: 1) The extent to which the public is aware of DEQE, its general mission and its specific programs; 2) How satisfied is the public with the job that DEQE has done; 3) What are the environmental concerns and priorities of the general public; 4) How well are these concerns matched by appropriate DEQE programs; and 5) How satisfied is the public with its access to DEQE and the outreach and educational programs of that agency.

The survey reported here is a first attempt to assess the closeness of the relationship between what DEQE is and what the public desires. The information yielded will ultimately assist the Department in providing external training and technical assistance to meet the specific needs of its various constituencies and to enhance its mission of better environmental protection. The resulting information base will also allow the Department's outreach programs to attain their goals of greater DEQE accessibility to the public and to encourage through education better compliance with environmental protection initiatives.

The data for this report come from responses to a telephone survey conducted in April and May 1989, commissioned by the Department of Environmental Quality Engineering and conducted jointly by The Environmental Institute and the Social and Demographic Research Institute of the University of Massachusetts at Amherst. Five hundred Massachusetts telephone owning residents were chosen randomly by computer generated telephone numbers. An adult in each was queried for an average of fifteen minutes using a battery of more than ninety questions.

The resulting sample was representative of Massachusetts telephone owning households and can be projected safely to the whole of the state's telephone households.

The major findings are summarized below:

- The citizens of our state believe that the environmental problems facing the state are serious. Solid majorities rated the problems of water pollution, air pollution, solid waste disposal and acid rain as either "very serious" or "somewhat serious".

- The pollution of lakes, streams and coastal areas is seen as the most serious environmental problem facing the state.

- State environmental problems are seen as especially serious by people who use the environment for recreational purposes, younger citizens, by homeowners and by the better educated segment. Those who use the environment or are more vulnerable to environmental risks in other respects are worried about the state's environmental problems.

- Local environmental problems are viewed as not as serious as state problems, according to our respondents. This finding probably reflects the fact that many of the environmental problems are not present in each of the local communities involved although the problems are clearly present in the state.

- Drinking water purity is viewed as the most serious local environmental problem. Apparently respondents are more concerned about the future than the present because they rate their own drinking water quite highly.

- State citizens mainly abide by environmental regulations affecting their households. Majorities dispose of hazardous household wastes -- used motor oil, paints and thinners and building materials scraps -- using acceptable procedures.

- Concern for and knowledge about environmental problems and programs go hand in hand. Respondents who believe that the state environmental problems are serious are also more likely to know about environmental programs and have opinions about them. In short, there is an interested and concerned audience for environmental issues.

- DEQE is a household word. More than four out of five had heard of DEQE, recognizing either its full title or its initials. This acquaintance is not a very deep one as indicated below.

- Most had heard of DEQE through the mass media, presumably in media pieces about the agency or through news items. One in five had had direct contact with DEQE, mainly in the form of some sort of business transaction.

- Although majorities had heard of some of the programs run by DEQE -- Vehicle Emission Testing, Hazardous Site Cleanup, Wetlands Protection and Recycling programs -- only minorities had heard of others -- Water Pollution Control, Waste Water Treatment, Solid Waste Disposal, Clean Lakes, Acid Rain Monitoring, Water Management, and Community Composting. At the one extreme, more than eight of ten had heard of the Vehicle Emission Testing program, and, at the other extreme, fewer than one in ten had heard of the Community Composting program.

- DEQE sponsorship of its major state environmental programs is known only by minor proportions of the citizenry. Although many know about the programs, few know that they are run by DEQE. Less than one in ten know that the Vehicle Emission Testing program is run by DEQE, and the program best known as a DEQE program -- Hazardous Waste Site Cleanup -- is known as a DEQE program by less than one in three citizens.

- Few citizens believe that state environmental programs are "excellent" or "fair" in dealing with the environmental problems faced by the state. Sizable proportions -- ranging from one in four to one in four to two in five -- believe that major state environmental programs are doing poorly in dealing with the problems involved. Adding together those who believe the programs are doing only a fair job to those who think they are doing poorly, large preponderances -- 70 to 85 percent majorities result.

- The more serious environmental problems were believed the to be, the more poorly the programs were rated. Those who were concerned and worried about environmental problems rated the programs as performing more poorly than those who thought the problems were not serious.

- Very strong popular support exists for increased funding, stricter regulations, and higher priority for environmental programs. Sixty to eighty percent of the respondents endorsed increased support for state environmental programs. In this respect, the citizens of Massachusetts reacted much as the national public does to national environmental problems.

- In short, Massachusetts citizens are concerned about the environment. Believing environmental problems are serious and despairing that current programs fall far short of the effort needed, they are willing to see the programs expanded, better supported, and enforced more vigorously so that the gap between the need for environmental protection and the state effort is appreciably narrowed.

- We recommend that DEQE plan and carry through a research program designed to monitor changes over time in public knowledge of and support for environmental programs as well as special focused studies of important issues. The special studies might include such issues as support for tax increases to support the level of environmental protection desired by the public and others.

Chapter 1

How The Survey was Conducted

In all societies, but especially in democratic ones, public opinion plays an important role in determining the course of public policy, although rarely a dominant one. Everything else held constant, legislatures and public officials would lean in the direction of providing and maintaining programs that enjoy widespread public approval. But there are two important qualifiers to the statement in the last sentence: First, things are rarely held constant: There are many competitors for dominance in the political process, including fiscal and constitutional constraints and the wide variety of competing programs. Second, public opinion is neither obvious nor easily ascertained. This report represents an attempt to make visible public opinion on an important set of issues. In that sense, it is, hopefully, a contribution to the political process providing information that may be helpful both in the administration of the programs in question and in formation of public policy in the substantive areas concerned.

We believe our findings are both illuminating and timely. The survey's results provide firm evidence on both the content and strength of public opinion on environmental issues and the Commonwealth programs designed to address those issues. The findings should prove useful in guiding environmental policy and program operations. The main reason to conduct the study was to provide such information on public opinion about environmental protection in the Commonwealth.

The survey is also timely. It is no secret that the Commonwealth is faced with considerable uncertainty about its public finances. Tax dollars currently are scarce forcing painful deliberations about what should be the priorities for allocating the currently short financial resources. Playing an important role in those deliberations are beliefs about the desires of the Commonwealth citizenry. Programs which are believed to be unpopular or little known could suffer from budget cuts rising out of the unfavorable fiscal situation, whatever evidence may exist of the need for them. In addition, programs believed to be considered by the public to be operating inadequately - whether in action or in funding level -- may face scrutiny during the budgetary constraints. Of course, there is an important distinction between what public opinion may be believed to be and what public opinion may be in fact. This survey was designed to provide measures of what public opinion in Massachusetts on major environmental issues was in late spring of 1989.

The Origins of the DEQE Household Survey

The Department of Environmental Quality Engineering (referred to here as the DEQE) is one of five (5) departments within the Massachusetts Executive Office of Environmental Affairs (EOEA). Designated as the chief environmental protection division within the EOEA, the DEQE oversees a large number of programs and a larger number of projects and environmental concerns ranging from automobile emissions control, to the disposal of hazardous wastes, to wetlands protection. The quality of life of all Massachusetts citizens is directly and indirectly influenced by the efforts of the DEQE. Therefore, understanding and assessing the public perceptions of environmental concerns is essential for insuring that the DEQE can adequaltely fullfill its mission to protect the environment and serve the public.

In order to examine the public's perceptions of the environmental condition of the state of Massachusetts, and the role of the DEQE, a public opinion survey of residents within Massachusetts was needed. Researchers at the Social and Demographic Research Institute (SADRI), in cooperation with The Environmental Institute (both at the University of Massachusetts, Amherst), carried out the research project over a five (5) month period encompassing February through June, 1989.

In November, 1988, the DEQE approached The Environmental Institute to undertake a state-wide survey of the knowledge held and opinions about state and local environmental issues. The DEQE indicated its concern with the following issues:

- In the minds of the Massachusetts citizenry, how serious are the environmental problems faced by the state?

- How well known is the DEQE and its programs?

- How satisfied is the public with the performance of major DEQE programs?

- How much support is there among the public for possible augmentation of support for DEQE programs?

- Most importantly, the DEQE was also concerned to obtain information on how their efforts could be improved to provide outreach and education programs aimed at improving the public's awareness on these issues.

In order to carry out the survey, The Environmental Institute entered into a collaborative effort with The Social and Demographic Research Institute (SADRI). SADRI staff have had considerable experience in the design and conduct of sample surveys.

Deliberations on the content of the questionnaire began in January, 1989. Members of the SADRI and The Environmental Institute staffs met with staff of the DEQE Office of Research and Standards to discuss the project, and to outline areas in which the DEQE was concerned.

Because of the time constraints involved, particularly the need to have the project completed before the end of the fiscal year, and fiscal necessities, it was agreed that the best course of action for assessing public perceptions was to conduct a telephone survey of Massachusetts residents. As allotted, the funds available allowed for a 15 minute interview. Market Street Research, a private research firm in Northampton MA, was given a sub-contract to conduct the telephone interviews.

Several drafts of the questionnaire were exchanged between SADRI and the DEQE, with the needed revisions being completed in early April, 1989. A pretest of final survey instrument was conducted by Market Street Research during the first week of April. Final approval of the survey contents was made by the Office of Research and Standards, and data collection began on April 18. Appendix A contains the final draft of the questionnaire used in the project.

The survey instrument emphasized three main topics: First, it covers issues important to the public educational activities of DEQE, including items ascertaining the extent of public knowledge about the DEQE, knowledge about a variety of specific DEQE programs, and satisfaction with the State's efforts at dealing with environmental problems. Second, the survey gathers information on individual practices directly related to the operations of the DEQE, particularly automobile use, disposal of household waste products, and various individual and household activities that have impacts upon the environment. Third, the survey measures the strength of public concern with the environment. These items include ratings of how serious respondents regarded environmental problems facing their localities and the state as a whole. In addition, we asked them to tell us what they considered to be the most important environmental problem facing the state and their local communities.

In order to make possible a mapping of the distribution of opinions among subgroups of the population, we also collected information on critical social and demographic characteristics of respondents and their households as well as their locations in the state.

It is not possible to study opinions in any great depth within the scope of a short telephone interview. In particular, it was not possible to explore reasons behind respondents' answers or to develop elaborate measures of the respondents' exposure to environmental problems. However, the survey's more than 90 questions do cover a wide range of issues, ranging from household hazardous waste disposal to acid rain.

Sample Design and Data Collection.

The survey is based on a random sample of Massachusetts telephone owning households. The actual list of telephone numbers used to contact respondents selected for the survey was purchased by Market Street Research from Survey Sampling, a private research service in Fairfield, Connecticut. Survey Sampling constructed the list by randomly generating telephone numbers from each of the area codes and prefixes active in each Massachusetts county, with the sizes of the county samples drawn being proportionate to the populations of the respective counties.

The total number of respondents interviewed for this survey was 500. The final response rate for the data collection was 69.8 percent, a relatively high rate for telephone interviews. Survey Sampling provided a list of 3700 phone numbers to Market Street research. Of those numbers, Market Street randomly selected 1500 numbers to be used as the base from which numbers would be chosen for the sample.

Interviewing by Market Street Research was carried out between April 18 and May 17, 1989. Market Street Research employs trained, highly experienced telephone interviewers, and has established a strong track record for high quality data collection projects.

Once a telephone number was selected for inclusion in the call list, it was called repeatedly until either the number was answered or a maximum of ten unanswered calling attempts were made. If a telephone number was determined to be either a business phone, or "disconnected" (i.e. a recorded message indicated that the number was out of service), the number was taken out of the overall response rate. In all, 969 telephone numbers were called by Market Street interviewers. The eventual disposition of these 969 numbers is shown in Table 1.1.

Once a response was received to a dialed number, interviewers determined the total number of adults residing in the household contacted, and the proportion of those adults who were males. These numbers were then used by the interviewing program to randomly select one adult person (over 18) to be interviewed in that household.

If the individual selected for interviewing was not available, a time to call was obtained. Again, if the selected respondent was not available at the specified call back time, up to 10 attempts were made to complete the interview with that person. If, after 10 contact attempts, the individual had not been interviewed, that respondent was considered a "refusal".

If contact was made with a household, and the selected respondent refused to participate in the survey, the interviewers attempted to persuade the person to reconsider. Appendix A contains instructions used by interviewers in their attempts to convert refusers into cooperators. In those cases where all attempts at persuading the selected respondent to participate failed, a follow-up phone call to the same person was made one week later. In this follow-up, interviewers again attempted to persuade the respondent to cooperate. These are persons counted as refusals in Table 1.1. Market Street interviewers managed to persuade many who initially refused. In all, approximately 43 percent of the initial "refusals" were converted to completed interviews on subsequent call backs.[1]

In addition to those numbers which were contacted, 92 non-working numbers (unassigned and disconnected phones) and 161 ineligible numbers (businesses, government agencies, churches and other non-households) were dialed. Included in this group were also several numbers with Massachusetts exchanges which were for residences outside Massachusetts. Ineligible numbers were not considered in computing the response rate.

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[1] The final percentage of initial refusals could have been somewhat less had there not been time constraints on the project. Those persons who refused to be interviewed in the final week of the data collection phase were not re-contacted.

Table 1.1: Sample Fulfillment Experience

Total Telephone Numbers Called	969
Non-household Numbers	161
Unassigned (Non-Working) Numbers	92
Total Eligible Numbers Called	716
Completed Interviews	500
Refusals	147
Unable (Illness, Vacation)	12
Terminated before completion	4
Never Answered Calls	53
RESPONSE RATE (completed/eligible)	69.83%

Chapter 2

Characteristics of Survey Respondents

There are several approaches to appraising the quality of a sample survey and the worth of its findings. Among the more important is determining the extent to which the sample of households or persons drawn fairly represents the universe from which the sample was drawn. In the case of the present survey, this principle means that we need to examine the degree to which the sample corresponds to the adult population of our state.

The DEQE Household Survey is designed as a random sample of telephone owning households which include at least one person 18 years of age or older. Because more than nine out of ten Massachusetts households have telephones, the size of the bias introduced by the telephone interviewing approach used cannot be very large. Nevertheless the sample under-represents poorer households and persons in living arrangements, such as hotels, motels and boarding houses, in which units do not have individual telephone numbers.

A random sample of households is not quite equivalent to a random sample of persons. In household samples, persons living alone in a housing unit are more likely to be contacted than persons living in multi-person households all of whom share the same phone. The sampling strategy called for choosing one person out of each telephone household, a procedure that means that a person living alone is bound to be picked if his or her telephone number is chosen, whereas someone in a two person household has a fifty-fifty chance of being picked.

In addition to examining how representative is the sample drawn, this chapter will also provide a description of the social and economic characteristics of the sample. The data upon which this description is based come from a series of questions asking about respondents' personal and household characteristics. Also, some information, in particular the county of residence, gender of the respondent, and number of adult members in the household, were obtained by interviewers during the initial stages of the interview.

Sample Demographic Characteristics and Representativeness

The biases discussed above notwithstanding, a random sample of telephone owning households should mirror fairly closely the areal distribution of the population of the state. In particular, we are concerned with the extent to which each county in the state is represented in the survey sample proportionate to the population of that county. Indeed, as can be seen in Table 2.1, representation in the survey sample for each county in the Commonwealth is almost exactly the same as found in the general population distribution. Only two Counties, Plymouth and Suffolk, are represented in the survey population in different proportions than the general population by more than 0.2 percent. Plymouth is slightly over represented (7.4 percent in the survey sample versus 6.5 percent in the population) while survey respondents from Suffolk County, which includes Downtown Boston, are slightly under-represented (11.4 percent in the survey sample versus 12.4 percent in the population). These differences are small enough to have been generated by random fluctuations, or the "luck-of-the-draw" processes that are a necessary accompaniment of random sampling.

Table 2.1: County Distribution of DEQE Sample and of 1980 Census.

County of Residence	DEQE Survey	1980 Census[a]
Barnstable	2.8%	2.9%
Berkshire	2.4%	2.6%
Bristol	8.2%	8.2%
Duke	0.2%	0.2%
Essex	11.0%	11.2%
Franklin	1.2%	1.2%
Hampden	7.6%	7.8%
Hampshire	2.4%	2.2%
Middlesex	23.4%	23.4%
Nantucket	0.2%	0.1%
Norfolk	10.4%	10.2%
Plymouth	7.4%	6.5%
Suffolk	11.4%	12.4%
Worcester	11.4%	11.1%

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[a] 1980 United States Census City County Data Book, State Of Massachusetts, U.S. Bureau of the Census.

Overall, the respondent sample from the DEQE survey also closely represents the actual population in Massachusetts in several important respects. First, as can be seen in Table 2.2, the percentage of women interviewed in the DEQE survey is only slightly higher (by 0.6%) than that in the general Massachusetts population as recorded in the 1980 census. As was stated in the last chapter, the sampling strategy employed in the data collection phase was designed to insure that the proportion of male and female respondents corresponded to the respective proportions in the population.

The effect of sampling households rather than individuals is shown in the age distribution in the sample. The survey sample has more persons in the age range from 25 to 44, the age groups over-represented among single person households. Correspondingly, the sample has fewer respondents from among the youngest adults -- under 25 -- and those in their middle years -- 45 to 64. Persons over 65, many of whom live alone, are more in balance with the 1980 census.

There are also several areas of comparison in which the survey sample is not as closely matched with the 1980 population characteristics. Of particular interest here are the differences found when examining the respondents' level of education. As can be seen in Table 2.2, there are some marked differences between the survey sample and the 1980 Census population in educational attainment. The proportion of respondents from the survey with more than a high school degree (61.2) is much larger than the proportion of the general population (36.7 percent). In addition, the sample has a markedly higher proportion of persons with bachelors and graduate degrees. These marked differences are due, we believe, to the over sampling of single person households in the survey.

Table 2.2: Selected Sample Demographic Characteristics

A. Gender of Respondent

	DEQE Sample	1980 Census
Women	55.0	54.6
Men	45.0	43.4

B. Age At Last Birthday

	DEQE Sample	1980 Census
18 to 24	12.6	18.4%
25 to 34	26.2	22.1%
35 to 44	23.8	14.8%
45 to 54	10.6	13.6%
55 to 64	10.4	14.0%
65 and over	16.4	17.1%

C. Highest Level of Education

	DEQE Sample	1980 Census
Grade school	6.4	25.9%
High school diploma	32.4	37.4
Some college	21.8	18.6
Technical school-junior college diploma	7.4	[•]
Four year college degree	20.4	9.9
Graduate degree	11.6	8.2

[•] Census data on Trade/Junior College graduates not available.

Household Composition.

In addition to questions concerning the "basic" demographic characteristics of age, gender, and location of residence, information on the composition of the household was also obtained in the interviews. In particular, information about the number of adults living in the residence, the number of young children present, and the marital status of the respondent was collected in order to more thoroughly analyze the survey findings.

As can be seen in Table 2.3, in over 40 percent of the households surveyed, the respondent interviewed was the only adult living in that residence. In addition, almost 13 percent of the respondents lived in residences in which three (3) or more adults lived, although the relationships of these adults to the respondent were not determined. Slightly more than 45 percent of the respondents lived with only one other adult over the age of 18.

The vast majority, 79.8 percent, of the respondents interviewed lived in households without any children under the age of 6. Approximately 12 percent of the respondents lived in households with one young child present, and an additional 8 percent lived in households with 2 or more young children.

Respondents were also asked about their current marital status. As can be seen in Table 2.3, slightly less than 55 percent of the respondents interviewed are married. An additional 11.3 percent of the respondents are widowed, and less than 10 percent are either divorced or separated. Approximately 1/4 of the respondents indicated that they have never married.

Table 2.3: Selected Sample Demographic Characteristics

D. Number of Adults 18 and over in Household

	DEQE Sample
1 Adult, 18 yrs+	41.6%
2 Adults, 18 yrs+	45.6%
More than 2 Adults	12.8%

E. Number of Children under 6 In Household

	DEQE Sample
0 Children	79.8%
1 Child	12.4%
2 Or more children	7.8%

F. Marital Status

	DEQE Sample	1980 Census
Married	54.8%	52.9
Single	24.8%	31.7
Divorced/Separated	7.3%	7.2
Widowed	11.3%	8.2

Socio-Economic Indicators.

Several items were also included in the survey which were designed to address the socio-economic status of the respondent. In particular, the respondents work status and the total household income were obtained in order to allow us to examine whether those persons with greater personal resources available perceive environmental concerns differently than those without increased resources.

In order to obtain information on work status, respondents were asked a series of questions. First, respondents were asked " Last week, were you working full time, part time, not working, keeping house, or were you in school?". If the respondent was working either full time or part time, additional questions were asked to determine whether the respondent worked for themselves, worked for private individual or company, or whether they worked for a branch of the government. Government workers were then asked whether they worked for the local, state or federal government.

As can be seen in Table 2.4, more than one half of the respondents (54.4 percent) stated that they were employed full time last week. An additional 13.3 percent of the respondents stated that they were working part time. Less than 10 percent indicated they "kept house," while less than three percent of the respondents were in school at the time of the interview. Slightly less than 20 percent indicated that they were not working. Of those persons working, approximately 20 percent were self employed. Slightly more than 12 percent of those persons who were working were employed by a branch of the government - the majority of whom worked for the local government.

Obtaining specific information on respondent income in telephone surveys is often difficult because of respondent concerns with the information being "too personal." Thus a more general income question was designed in order to insure that respondents would provide the information. In this survey, respondents were asked "Which of these categories represents your total household income for 1988?" Interviewers proceeded to read 10 categories, beginning with "less than $10,000," then proceeding with $5000 intervals until reaching $40,000. Above $40,000, categories included "40,00 to 49,999," "50,000 to 59,999," and then $60,000 or above. The distribution of respondent household income is presented in Table 2.4.

As can be seen in Table 2.4, of those respondents who answered the question on income -over 12 percent of the respondents refused to answer the question -almost 19 percent stated that their household income was more than $60,000 in 1988. An additional 18 percent stated that they earned between 40,000 and 60,000 last year. Note, however, that over 25 percent of the respondents earned less than $20,000, while an additional 20 percent earned between $20,000 and $30,000 in 1988. The median household income for respondents fell within the $30,000 - $35,000 category.

In sum, it appears that the survey respondents are closely representative of the state as a whole with respect to geographic location and with respect to certain demographic characteristics. The proportion of respondents from each of the counties closely resembles the population distribution in the state, and the proportions female and male, by virtue of the sampling design, are also close to that of the state as a whole.

However, there are departures: First, the age distribution of respondents over-represents young adults aged 25 to 45. The overall income and education levels of the respondents somewhat over-represented in the upper ranges of the distribution. Over 35 percent of the respondents earned more than $40,000 in 1988. The sample obtained is also highly educated, with 32 percent of the respondents having a degree from a 4 year college. Eleven (11) percent of the respondents have at least one graduate degree.

Table 2.4: Work Status and Income

A. Work Status		
	Working full time	54.4
	Working part time	13.3
	Not working	19.9
	Keeping house	9.6
	In school	2.8
B. Annual Household Income		
	Less than $10,000	11.6
	10,000 to 14,999	6.2
	15,000 to 19,999	7.5
	20,000 to 24,999	9.8
	25,000 to 29,000	10.5
	30,000 to 34,999	9.1
	35,000 to 39,000	8.7
	40,000 to 49,999	8.2
	50,000 to 59,999	9.8
	60,000 or more	18.7

DEQE Region

Of particular interest to this project, and to the DEQE, is the extent to which the different parts, or regions, of the Commonwealth perceive environmental concerns and the work of the state at protecting the environment differently. In particular, the DEQE is interested in the extent to which the 4 primary regions of the DEQE are similar, or different with regard to perceptions of the issues raised in this survey. In order to assess these regional differences, the town or city in which the respondent lived, as well as the county of residence, was obtained.

The Western Region, includes all of the towns in Berkshire, Franklin, Hampshire, and Hampden Counties. The Central region, includes all of Worcester County, approximately 1/3 of the towns and cities Middlesex County, and several towns from Norfolk County. The Southeast Region includes all of Nantucket, Dukes, Barnstable, Bristol and Plymouth County towns, as well as a number of Norfolk County towns. The Northeast Region includes all of Metropolitan Boston and the North Shore, covering all of Suffolk and Essex Counties, as well as the majority of Norfolk and Middlesex Counties. In Table 2.5, the distribution of respondents by DEQE Region is presented.

Table 2.5: Respondents' Region Of Residence

Region of Residence	N	% Respondents
Northeast Region	229	45.8%
Southeast Region	103	20.6%
Central Region	100	20.0%
West Region	68	13.6%

Chapter 3

Environment-Related Household Practices

Introduction

The purpose of this chapter is to place our respondents into their environmental niches. We will be concerned with such topics as the sources of their domestic water supplies, how they dispose of their sewage, trash and garbage, and how much they use the environment for certain recreational uses. Of course, these household practices can be expected to vary according to the region of the state in which they are located, the socio-economic status of the households involved, and by their demographic characteristics, and such variations will be shown.

An additional reason for introducing these measures of the envirommental situations and household practices is that they will be used heavily in the chapters that follow to help explain why respondents are interested and concerned about environmental problems and how well they regard the state's efforts to improve the environment.

Household Water Supply

The attainment and preservation of a reasonably high quality domestic water supply is a public health issue that involves environmental concerns. Those who receive their domestic water from a municipal or town water system are as vulnerable in principle as those who rely on domestic wells. However, the monitoring of a public water supply is more easily and adequately accomplished by its operators than domestic wells can be overseen by their owners. Municipal water may be safer because it is more consistently and professionally monitored and more consistent in those qualities over time.

However, there are countervailing advantages to domestic well water. The chemicals added by water systems often detract from the taste of water drawn from municipal systems. The system of reservoirs and pipes may be antiquated and poorly maintained allowing harmless but quality degrading substances to enter the water supply. Indeed, respondents relying on well water rate its quality higher than municipal water users regard theirs.[1]

Whatever the balance may be of relative advantages and disadvantages of alternative sources of domestic water supply, it is important to examine how access to each system is distributed among the Massachusetts population.

Almost all (98%) of the respondents knew whether their household water supply came from their own wells or from a city or town water system. (See Table 3.1, Panel A, right-hand column.) About one in six (16%) rely on private wells for their household water supply as opposed to water piped in from a town or city water supply system. A handful do not know from whence their domestic water supply came.

Of course, reliance on domestic wells varies considerably by DEQE region, as shown in Panel A. of Table 3.1. Nearly nine out of ten (89%) of households in the Northeast Region get their domestic water from a municipal or town water supply, in contrast, to three out of four (75%) in the Western Region.

Again, as might be expected, renting households are more likely to rely on municipal water systems than homeowners (94% versus 77%) since rental units are more likely to be located in more urbanized areas. Consistent with these tenure differences, the highest income households are more likely to be using private wells to supply their water needs.

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[1] As can be seen in the accompanying table, Those persons who indicated that they get their water from private wells rated the water quality almost 2 points higher on the 10 point scale than those who indicated they get water form a muinicipal supply.

Water Source	Average Quality Rating	N
Private Well Water	8.33	79
City/Municipal Water	6.36	413
Don't Know	5.00	8

(Based on scale where "10" represents best quality, 1 represents worst quality. differences statistically significant at $p < .000$).

Table 3.1: Household Water Supply

A. DEQE Region (percentages)

Water Supply	North East	South East	Central	West	State Total
Well Water	8.3	18.4	24.0	25.0	15.8
City Water	89.1	81.6	74.0	75.0	82.6
Unknown	2.6	2.0	0.0	0.0	1.6
N=	[229]	[103]	[100]	[68]	[500]

B. Tenure (percentages)

	Renters	Homeowners
Well Water	2.9	22.5
City Water	93.6	76.9
Unknown	3.5	0.6
N=	[171]	[329]

C. Respondent Age (percentages)

	under 35	35-44	45-54	55-64	65+
Well Water	12.6	18.5	18.9	25.0	12.2
City Water	84.7	80.7	79.2	73.1	87.8
Unknown	2.6	0.8	1.9	1.9	0.0
N=	[190]	[119]	[53]	[52]	[82]

Number of Missing Observations = 4

D. Household Income (percentages)

	under $20K	$20K-34	$35K-50K	$60K+
Well Water	9.9	14.0	16.2	24.4
City Water	87.4	85.3	82.9	74.4
Unknown	2.7	0.8	0.9	1.2
N=	[111]	[129]	[117]	[82]

Number of Missing Observations = 61

The Handling of Domestic Sewage

In modern times, perhaps the most dramatic of all advances in public health occurred in the 19th Century with the building of public sewage disposal systems in urban areas and the development of septic tanks for the containment and handling of domestic wastes for areas in which municipal sewage systems were not feasible to build. Indeed, without the septic tank system (or some equivalent) the widespread residential patterning of today would not be possible.

When properly installed and maintained, septic tanks guard the health not only of the households using them but also the health of households who rely on the aquifers into which the leach fields drain.

Although a majority (60%) of our respondents are connected to a municipal or township sewer system, a large number of respondents (36%) rely on septic tanks. (Four percent did not know what sewage disposal means their household was connected to.) (See Table 3.2.)

As shown in Panel A of Table 3.2, regional differences are marked: 70% of the Northeast Region households were connected to a municipal or township sewer system in contrast to only 47% of those in the Central Region and in the Southeast Region. Surprisingly, the usage of municipal sewer systems also is high (66%) in the Western region.

Much of the regional differences can be explained by the strong contrast between homeowning and renting households. About half (50%) of the homeowners use septic tanks in contrast to only 12% of the renters. Consistent with these tenure differences are those associated with household income: among the wealthiest households (annual incomes over $60,000) a majority (57%) use septic tanks whereas among the poorest households (under $20,000 annual income) only a small number of households (16%) do so.

The proper maintenance of a septic tank system requires that it be periodically pumped out and the digested sewage hauled to a sewage disposal plant. The appropriate periodicity of pumping depends on size and usage. Typically, a septic tank serving an average-sized household should be pumped out every two or three years. Most Massachusetts households who use septic tanks claim they follow that rule: Almost half (48%) have their tanks pumped every two years or more frequently and another third (32%) "every three or more years"[2]. One in ten (10%) claimed that they never pumped out their tanks and an equal proportion (10%) did not know how frequently the pumping was done. Assuming that most of the 32% who claimed to do so every three or more years actually did so every three years, most tanks appear to be properly maintained. However, the one in ten households who claim never to do any pumping clearly represent a threat to the integrity of the surface water when a septic tank overflows, and to groundwater in the vicinities in question when the overflow seeps into the ground.[3]

Regional variations in septic tank maintenance practices are also shown in Table 3.3. (The small numbers of septic tank users preclude any additional breakdowns.) The most noteworthy regional differences consist of the relatively high proportions (18% and 23%) of Southeast and Western Regions households who have never had their tanks pumped out.

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[2] Unfortunately, the question used did not discriminate between those who had their tanks pumped out every three years and those who did so at longer intervals.

[3] Of course, some of these households may be of such short tenure in their homes that they may not yet have come up against the necessity to do any pumping, as the following suggests:

	Years at Present Address		
Periodicity	3 or less	4 to 9	10 or more
Never	10%	21%	5%
Don't know	24%	4%	5%
N=	[51]	[48]	[80]

Nearly one in four who have lived at their present address less than four years did not know how often they cleaned out their septic tanks, and another one in ten claimed never to have done so. What is surprising is that more than one in five of those who lived in their homes for four to nine years never have had their tanks pumped out. An optimistic note is shown by those who lived in their homes for a decade or more: only one in ten of this group either never had cleaned out their tanks or claimed not to know how often the cleaning was done.

Table 3.2: Sewage Disposal Methods

A. DEQE Region (percentages)

	North East	South East	Central	West	State Total
City System	70.3	46.6	47.0	66.2	60.2
Septic Tank	25.3	49.5	50.0	32.4	36.2
Unknown	4.4	3.9	3.0	1.5	3.6
N=	[229]	[103]	[100]	[68]	[500]

B. Tenure (percentages)

	Renters	Homeowners
City System	80.1	49.8
Septic Tank	11.7	48.9
Unknown	8.2	1.2
N=	[171]	[329]

C. Respondent Age (percentages)

	under 35	35-44	45-54	55-64	65+
City System	64.2	47.9	66.0	53.8	69.5
Septic Tank	29.5	52.1	30.2	46.2	25.6
Unknown	6.3	3.8	0.0	4.9	0.0
N=	[190]	[119]	[53]	[52]	[82]

Number of Missing Observations = 4

D. Household Income (percentages)

	under $20K	$20K-34	$35K-50K	$60K+
City System	77.5	71.3	49.6	40.2
Septic Tank	16.2	27.9	48.7	57.3
Unknown	6.3	0.8	1.7	2.4
N=	[111]	[129]	[117]	[82]

Number of Missing Observations = 61

Trash Disposal

American households are reputed to enjoy the dubious honor of first place in the international ranking of per capita production of household wastes. In our state, as in many others, the disposal of household garbage and trash is approaching crisis proportions as the costs of waste disposal rise and as land available for use as landfill areas becomes more and more scarce.

We dispose of our trash and garbage in a variety of ways. In many locales, municipal or town trash collectors pick up household wastes and dispose of them in local or regional landfills. Other localities are served by privately run trash collection firms. In still other places, residents carry their trash to the local land fills. In addition, in many places, residents can choose among all three alternatives.

As Table 3.3 indicates, nearly two out of three (65%) of our respondents dispose of their trash and garbage using a municipal or town collection services. Nearly one of five (18%) use a private scavenger. Smaller proportions (15%) carry their own trash to a local or regional landfill or (2%) use some "other method".[4]

As usual, regional variations exist, as shown in Panel A of Tale 3.3. Three out of four (75%) of Northeast Region households use a municipal trash collector whereas less than half (48%) of Central Region households do so. Private scavengers are most frequently used in the Southeast and Central Regions (26% and 22%) which are also the regions in which the largest proportions take their waste to local or regional landfills (26% and 18%). The remaining panels of Table 3.3 indicate that there are just a few strongly differing patterns by housing tenure, age or household income. First, renters are more likely to use private scavengers than homeowners, decisions made most likely by their landlords and, correspondingly, owners are more likely to bring their own trash to local landfills. Second, there appear to be no notable trends by age. Finally, the wealthier the household, the more likely it is to use landfills, likely reflecting homeownership and location.

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[4] The questionnaire does not provide any information on what were these "other methods".

Table 3.3: Trash Disposal Methods

A. DEQE Region (percentages)

	North East	South East	Central	West	State Total
City Collection	74.7	61.2	48.0	60.3	64.6
Private	13.5	19.4	26.0	22.1	18.4
Landfill	7.9	17.5	26.0	16.2	14.6
Other	0.9	1.0	0.0	0.0	0.6
Unknown	3.1	1.0	0.0	1.5	1.8
N=	[229]	[103]	[100]	[68]	[500]

B. Tenure (percentages)

	Renters	Homeowners
City Collection	63.2	65.3
Private	25.1	14.9
Landfill	6.4	18.8
Other	0.6	0.6
Unknown	4.7	0.3
N=	[171]	[329]

C. Respondent Age (percentages)

	under 35	35-44	45-54	55-64	65+
City Collection	67.9	68.9	56.6	55.8	63.4
Private	16.8	12.6	24.5	19.2	23.2
Landfill	12.6	16.8	17.0	23.1	9.8
Other	0.5	0.0	1.9	0.0	0.0
Unknown	1.2	2.1	1.7	1.9	2.4

Number of Missing Observations = 4

D. Household Income (percentages)

	under $20K	$20K-34	$35K-50K	$60K+
City Collection	63.1	70.5	60.7	65.9
Private	24.3	13.2	19.7	13.4
Landfill	8.1	14.7	17.1	19.5
Other	0.9	0.0	0.9	0.0
Unknown	3.6	1.6	1.7	1.2
N=	[111]	[129]	[117]	[82]

Number of Missing Observations = 61

Disposing of Building Materials

Not all trash is equally problematic in posing disposal problems. Among the more worrisome are scrap building materials, waste materials produced in the course of building construction or renovation, a heterogeneous class that often can include substances that produce dangerous leachates. Hence building materials and scraps must be carefully disposed of.

The majority of households (69%) did not generate any building materials scrap over the last year. (See Table 3.4.) As Panel A shows, Central Region households were the most likely (36%) to generate these wastes whereas Northeast area were least likely (28%), a pattern that likely reflects both the volume and kind of construction and renovation going on in those regions.

For those who did dispose of such materials over the past year, the most common method of disposal was to include them with the rest of household trash and garbage: One-third (34%) used that method. Another one in three (30%) brought the scrap materials to their local landfill. For about one in six households (15%) "someone else" --contractors and builders- disposed of the building materials. About one in eight disposed of the scrap by burning it. A few (3%) buried the waste on their property or simply stored it there and the same proportion (3%) used some other method.

The major regional difference lies between the Northeast Region, a majority (54%) of whose households dispose of their building materials waste through the regular trash collection methods, and all the other regions where such levels range from 17% to 29%. Outside the Northeast Region, householders primarily truck their wastes to the local and regional landfills.

As might be expected, homeowners are more likely to produce building materials waste than renters (38% in contrast to 16%), mainly because homeowners are more likely to make structural and decorative changes in their homes. Correspondingly, renters are more likely to dispose of their wastes through their local waste collection system while homeowners tend to rely on their landfills and disposal through burning.

Wealthier households are likely to produce more building wastes, a spread ranging from 15% for the poorest category of households to 43% for the wealthiest category. Disposal methods also vary by income with the least well-off more likely to use their local waste collection system and wealthier households more likely to use other methods.

Table 3.4: Disposal Last Year of Building Materials and Scraps

A. DEQE Region (percentages)

	North East	South East	Central	West	State Total'
Disposed of Building Materials	28.2	31.1	36.0	30.9	30.7
Disposal Method					
With trash	53.8	21.2	16.7	28.6	34.0
On property	1.5	3.0	2.8	9.5	3.2
Burned	4.6	15.2	22.2	14.3	12.3
Landfill	20.0	33.3	41.7	33.3	29.7
Someone else	12.3	18.2	16.7	14.3	14.8
Other	4.6	6.1	0.0	0.0	3.2
Don't know	3.1	3.0	0.0	0.0	1.9

B. Tenure (percentages)

	Renters	Homeowners
Disposes of Building Materials	15.9	38.4
Method of Disposal		
With trash	48.3	31.7
On property	0.0	4.0
Burned	0.0	15.1
Landfill	24.1	31.0
Someone else	13.8	15.1
Other	3.4	3.2
Don't know	10.3	0.0

C. Household Income (percentages)

	under $20K	$20K-34K	$35K-50K	$60K+
Disposes of Building Materials	14.5	39.1	35.9	42.7
Method of Disposal				
With trash	52.9	32.0	38.1	25.7
On property	0.0	0.0	7.1	5.7
Burned	0.0	16.0	9.5	8.6
Landfill	17.6	36.0	31.0	31.4
Someone else	17.6	14.0	11.9	20.0
Other	5.9	2.0	2.4	5.7
Don't know	5.9	0.0	0.0	2.9

Disposing of Crankcase Oil

Almost all (93%) of the households own at least one car and almost two out of three households (63%) own two or more cars. Hence, disposing of crankcase oils is a problem that affects almost all households. Of course, the majority (69%) of households (see Table 3.5) have their oil changed at gas stations, lubrication services, or at auto-repair shops, who, in turn, hopefully, dispose of the used oil in an environmentally safe way. The nearly one in three households who change their own automobile oil may or may not use appropriate disposal methods.

A bare majority of households disposed of used automobile oil in clearly acceptable ways, one fourth (26%) depositing their used oils with the retail store from which they purchase their oil and another quarter (26%) using a local or regional hazardous waste collection facility. The remaining half of those who change their own oil use a variety of potentially dangerous methods; 16% use their local household waste collection system, 8% dispose of the oil on their property, less than 0.1% pour the used oil into their sewers and a fairly large proportion (16%) claim not to know how their used oil is disposed of[5].

As shown in Panel A of Table 3.5, strong regional differences exist both in the prevalence of households' changing their oil and in the methods used for oil disposal. Northeast Region and Southeast Region households are least likely to change their own oil (26%) while those from the Central and West Regions (37% and 46%) are most likely to take care of their own oil changing. There are also regional differences in methods of disposal, with the Northeast Region households most likely to use their regular household waste collection method.

Weak patterns exist according to household income, as shown in Panel B. of Table 3.5. The wealthiest households are least likely to change their own oil (24%). Poorest households appear to be most likely to use illegal methods of oil disposal.

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[5] We can speculate that this high proportion may reflect both a reluctance on the part of respondents to report illegal disposal practices and a household division of labor in which someone else in their households take responsibility for oil changing.

Table 3.5: Disposal of Crankcase Oil

A. DEQE Region (percentages)

	North East	South East	Central	West	State Total
Changes own oil	25.6	26.3	36.7	46.0	30.9
Disposal Method					
Trash	26.8	16.0	8.3	3.2	15.5
Property	7.1	12.0	2.8	12.9	8.1
Sewer drain	1.8	0.0	0.0	0.0	0.1
Retail store	28.6	12.0	33.3	22.6	25.7
Hazardous Waste coll.	17.9	32.0	38.9	22.6	26.4
Other	3.6	20.0	5.6	9.7	8.1
don't know	14.3	8.0	11.1	29.0	15.5

B. Household Income (percentages)

	under $20K	$20K-34	$35K-50K	$60K+
Changes own oil	32.2	35.7	33.0	24.4
Disposal Method				
Trash collection	16.1	20.0	17.9	10.0
On property	19.4	8.9	2.6	0.0
Sewer drain	2.2	0.0	0.0	0.0
Retail store	12.9	33.3	20.5	35.0
Hazardous waste collection	19.4	22.2	35.9	40.0
Other	6.5	6.7	12.8	5.0
Don't know	25.8	6.7	10.3	10.0

Disposing of Household Paints and Thinners

Another variety of household wastes that present a potential danger in disposal consist of the waste products produced in house and decorative painting. "Empty" paint containers, surplus paints, solvents used to thin paints and to clean painting brushes and rollers are all materials which should be disposed of in ways that reduce the chance that paint products can contaminate the environment and water supplies.

Almost one in five (19%) of the respondents disposed of paints over the last year, as shown in Table 3.6. Two out of five households (42%) used a safe disposal method, bringing their painting wastes to local or regional hazardous waste collection points. The remainder used more or less disapproved methods, one in three (37%) tossing paint wastes in with their household trash, 7% disposing of the wastes on their own property, 2% pouring the wastes into sewer drains, the remaining 12% using other methods or claiming not to know what methods were used.

Fairly strong regional differences exist, as indicated in Panel A or Table 3.6. Half (50%) of Northeast Region households included their paint wastes in their household trash, a higher level than in any of the other regions. Southeast Region households were most likely (52%) to have brought their painting wastes to the local hazardous waste collection points.

Panel B of Table 3.6 indicates that homeowners are almost twice as likely (23% compared to 12%) to generate painting wastes and also were more likely to bring their wastes to a local hazardous waste collection point (49% in contrast to 18%).

Panel C of Table 3.6 shows that the higher the income the more likely were households to generate painting wastes, but there were no clear patterns concerning how such wastes were disposed of.

Table 3.6: Disposal of Household Paints and Thinners

A. DEQE Region (percentages)

	North East	South East	Central	West	State Total
Disposes of Paints, etc.	19.7	19.4	21.0	13.2	19.0
Disposal Method					
Trash	50.0	23.8	23.8	30.0	36.7
Property	4.3	4.8	14.3	10.0	7.1
Sewer drain	2.2	0.0	0.0	10.0	2.0
Hazardous Waste coll.	34.8	52.4	47.6	40.0	41.8
Other	4.3	14.3	9.5	10.0	8.2
don't know	4.3	4.8	4.8	0.0	4.1

B. Housing Tenure

	Renters	Owners
Disposes of paints, etc.	12.3	22.5
Disposal Method		
Trash	59.1	30.3
Property	9.1	6.6
Sewer drain	4.5	1.3
Hazardous Waste collection	18.2	48.7
Other	0.0	10.5
don't know	9.1	2.6

C. Household Income (percentages)

	under $20K	$20K-34	$35K-50K	$60K+
Disposes of paints, etc.	9.9	22.5	23.1	23.2
Disposal Method				
Trash collection	27.3	43.3	44.4	36.8
On property	9.1	3.3	7.4	0.0
Sewer drain	0.0	0.0	3.7	0.0
Hazardous waste collection	63.6	40.0	44.4	36.8
Other	0.0	6.7	0.0	26.3
Don't know	0.0	6.7	0.0	0.0

Household Waste Recycling Practices

Waste recycling programs hold some promise to reduce significantly the volume of our growing waste disposal problem. Practical waste recycling programs for household wastes require a change in household behavior usually involving sorting wastes into categories and also corresponding changes in how wastes are collected and stored. The proper meshing of changes in the practices of public agencies, private firms, and individual households will be difficult to accomplish universally. In addition, the establishment of a viable market in recyclable materials is also necessary for a fully successful program.

The DEQE Household Survey provides a perspective on waste recycling from the viewpoint of households. For households effectively to participate, public recycling programs have to exist and households have to be aware of their existence. Currently only some localities and regions have such programs in place. And, some households are not aware whether or not their localities have implemented such programs. The survey findings displayed in Table 3.7 indicate that slightly more than one in five (23%) households do not know whether their localities have a recycling program.[6] Furthermore, less than a third (31%) claim that their communities have recycling programs in place[7]. (Note that this amounts to 40% of those who claim to know about their communities' recycling activities.)

Most important is the finding that about one in five (22%) respondents participate in a state and/or local recycling program (not including returning bottles and cans to local retailers).

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[6] The question that elicited this high level of lack of knowledge followed several questions concerning the state waste recycling program and may have been influenced by those questions. Of course, it is difficult to know whether those questions led to an over- or under-estimate of the level of knowledge. On the one hand, reminding the respondent that a state program existed may have led respondents to confuse their local programs with that of the state. On the other hand, it may have aided the recall of their local programs.

[7] This level of participation in recycling activities is lower than that claimed by Americans generally. A 1986 Roper Organization national survey found that half claimed to be saving trash for recycling, an appreciably higher participation rate than found in our Massachusetts survey. In addition, more than half (56%) claimed to be living in states that had re-cycling programs. Of course, the Roper survey respondents may have included the return of deposit containers and bottles as their participation, an alternative that was excluded by the question the DEQE survey used.

There is a close relationship between the presence of a recycling program locally and participation: For respondents who live in municipalities towns/cities which are believed by them to have recycling programs, 45% participate in recycling, compared to 12% in towns that are not believed by respondents to have programs and 10% in towns in which the respondents do not know of any programs.

Regional differences, as displayed in Panel A of Table 3.7, are not very striking. Ignorance about the existence of local programs is highest in the Western Region (27%) and lowest in the Central region (15%), but participation rates are highest (28%) in the former and lowest in the latter (18%).

In contrast strong differences exist between renters and owners, as shown in Panel B of Table 3.7. Renters are least likely to know about the program (31%) and also least likely to participate (16%) while fewer homeowners are ignorant of local recycling programs (18%) but most likely to participate (25%).

Panel C of Table 3.7 displays fairly regular patterns: The higher the income the more likely to live in a community that has a program and the less likely not to know about such programs. Correspondingly participation increases the higher the annual family income ranging from 13% participants among the poorest to 34% among the most well-off.

Table 3.7: Presence and Use of Recycling Programs

A. DEQE Region (percentages)

	North East	South East	Central	West	State Total
Town/city has Program	32.3	31.1	26.0	36.8	31.4
Don't know of program	24.5	23.3	15.0	26.5	22.6
Uses state/ local recycle program	23.6	18.4	18.0	27.9	22.0

B. Housing Tenure

	Renters	Owners
Town/city has Program	34.5	29.8
Don't know of local program	31.0	18.2
Uses state/ local recycle program	16.4	24.9

C. Household Income (percentages)

	under $20K	$20K-34	$35K-50K	$60K+
Town/city has Program	29.7	30.2	30.8	40.2
Don't know local program	27.9	21.7	16.2	18.3
Uses state/ local recycle program	12.6	21.7	22.2	34.1

Recreational Environmental Use Patterns

Out of the many ways in which one can use the environment for recreational purposes, the DEQE Household Survey focused on only two: 1) swimming (or water-skiing) in public lakes, streams or off our beaches, and, 2) fishing in the same waters. (See Table 3.8.) Swimming is clearly the most popular of the two: Two out of three swim at least once or twice a year. In contrast, less than one in three (32%) fish in the same waters at least once or twice a year. Fishing and swimming are not mutually exclusive uses of the environment. About one in four (27%) of our respondents engage both in fishing and swimming.

As Panel A of Table 3.8 shows, there are no strong regional differences in the two recreational activities. Swimming is engaged in by three out of four (74%) respondents from the Central region and is least (60%) frequent among those in the Western Region. Fishing is characteristic of two in five (40%) of the Southeast Region residents and lowest (26%) among Northeast Region residents. Southeast residents are most likely to engage in both (33%) and Western regions the least likely to do so (22%).

As might be expected, both swimming and fishing are strongly and negatively related to age. Almost four out of five (78%) of those under 35 swim, but only one in four (24%) of the 65 and over do so. A comparable age gradient exists for fishing, ranging from 43% of the under 35 to 12% of the 65 and over. Corresponding age related declines exist for those who both fish and swim.

Although neither fishing nor swimming are recreational activities that involve large expenditures, both are strongly and positively related to income. Only half (50%) of the least well-to-do swim in contrast to four out of five (81%) of the most well-off. Corresponding income related trends hold for fishing, ranging from about one in five (21%) among the poorest to more than two in five (44%) among the most well-off. Even stronger income related trends exist for engaging in both fishing and swimming: 14% of the least well-off in contrast to 42% of the most well-off.

Table 3.8: Recreational Environmental Use

A. DEQE Region (percentages)

	North East	South East	Central	West	State Total
Swims	67.2	64.7	74.0	55.9	66.5
Fishes	26.0	39.8	36.0	30.9	31.5
Both	23.6	33.0	30.0	22.1	26.6
N=	[229]	[103]	[100]	[68]	[500]

B. Tenure (percentages)

	Renters	Homeowners
Swims	66.1	66.8
Fishes	32.0	31.3
Both	26.9	26.4
N=	[171]	[329]

C. Respondent Age (percentages)

	under 35	35-44	45-54	55-64	65+
Swims	78.4	78.8	75.5	51.9	24.4
Fishes	43.1	37.8	18.9	21.2	12.2
Both	37.9	35.3	15.1	13.5	4.9
N=	[190]	[119]	[53]	[52]	[82]

Number of Missing Observations = 4

D. Household Income (percentages)

	under $20K	$20K-34	$35K-50K	$60K+
Swims	50.0	70.5	79.5	80.5
Fishes	20.9	33.3	37.9	43.9
Both	14.4	29.5	33.3	41.5
N=	[111]	[129]	[117]	[82]

Number of Missing Observations = 61

Proximity to Undesirable Land Uses

Dwellings are situated in locations that may contain nearby activities that are potential sources of environmental problems. The DEQE Survey asked about a number of these activities, including factories, gas stations, landfills and sewage treatment plants, all within half a mile of the respondents' residences. When a respondent indicated that one of these potential sources was located near by, we also asked whether the activity posed any problems for them.

As shown in Table 3.9 only gas stations are located within half a mile of the majority of respondents (58%). All of the others propose potential problems to only a small number of respondents: nearby factories affect one in four (28%) and nearby landfills and sewer treatment plants affect between one in 20 and one in ten (8% and 6%), respectively.

No serious level of problems was perceived as generated by any of these land uses. About one in ten residents (10%)[8] who had factories nearby stated that the factories posed problems.

Locations of undesirable land uses affect property values, however. Compared to homeowners, renters are more likely to have a factory or any of the other activities close by, according to respondents in this survey. Correspondingly poorer households are more likely to have any of the activities nearby than the better off. The income related effects are fairly strong. For example, two out of five (41%) of respondents whose annual income was less than $20,000 had nearby factories, compared to only 16% of the most well off. Poor households were more likely to live closest to any of the other potential problem sources, the major exception being landfills, a feature of suburban and rural areas in which the better off are more likely to live.

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[8] This percentage applies only to those who had factories within half a mile of their residences. The level of factory caused problems for the entire sample is less than 3%.

Table 3.9: Undesirable Nearby Land Uses (Percent with Uses within Half Mile of Residence)

A. DEQE Region (percentages)

	North East	South East	Central	West	State Total
Factory	24.0	24.3	35.0	38.2	28.2
Factory Problems[a]	9.1	12.0	5.7	15.4	9.9
Gas Station	63.3	53.4	52.0	55.9	58.0
Landfill	7.9	9.7	5.0	8.8	7.8
Sewer Treatment	7.0	3.9	6.0	4.4	5.8
N=	[229]	[103]	[100]	[68]	[500]

B. Tenure (percentages)

	Renters	Homeowners
Factory	40.9	21.6
Factory Problems	8.6	11.3
Gas Station	70.8	51.4
Landfill	8.2	7.6
Sewer Treatment	7.6	4.9
N=	[171]	[329]

C. Respondent Age (percentages)

	under 35	35-44	45-54	55-64	65+
Factory	36.3	31.1	24.5	13.5	18.3
Factory Problems	10.1	10.8	15.4	0.0	6.7
Gas Station	69.5	54.6	56.6	38.5	50.0
Landfill	9.5	8.4	13.2	5.8	1.2
Sewer Treatmnt	5.8	6.7	3.8	1.9	8.5
N=	[190]	[119]	[53]	[52]	[82]

D. Household Income (percentages)

	under $20K	$20K-34	$35K-50K	$60K+
Factory	41.4	31.8	23.1	18.3
Factory Problems	8.7	9.8	11.1	6.7
Gas Station	65.8	66.7	51.3	37.8
Landfill	5.4	10.1	5.1	8.5
Sewer Treatment	4.5	8.5	6.8	1.2
N=	[111]	[129]	[117]	[82]

[a] Asked only of those who had a factory within half a mile of their residences.

Chapter 4

The Perceived Seriousness of Local and State Environmental Problems

Introduction

In this chapter we turn to a consideration of how serious our respondents consider their local and state environmental problems to be. The data on seriousness were obtained through a series of questions asking respondents to rate how serious they believed each of five environmental issues to be in their city or town and in the state as a whole. Respondents were also offered the option of responding that they did not know how serious each problem was, forming measures of the extent to which respondents have crystallized opinions on the issues involved. The environmental issues included water pollution, acid rain damage, air pollution and solid waste disposal problems. Two questions asked the respondents to pick out what they considered to be the "most pressing environmental problem" facing their locality and facing the state as a whole. Because similar questions have been used on recent national surveys, we will be able to contrast Massachusetts residents' responses with those of the nation as a whole.[1]

The reader should be aware that this survey did not employ a commonly used approach in sample surveys on political issues. Many survey organizations instruct their interviewers to persuade respondents to give opinions and to urge them not to elect the response category, "I don't know". We believe that a sample survey should not form public opinion by "forcing" respondents to voice an opinion that is not fully formed. This common practice inflates the extent to which respondents hold firm opinions and is not able to distinguish an opinion of the moment from often encountered ambivalence and lack of interest in the topic under study.

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[1] The Social And Demographic Research Institute, as the representative for the University of Massachusetts, is a member of the Roper Center for Public Opinion Research, a non-profit research library at the University of Connecticut, Storrs, CT. The Roper Center Library contains information on thousands of public opinion surveys conducted over the past 50 years. Throughout the remainder of this report, references to "National Studies," and to NORC, Roper, Harris, Yankelovitch, etc. polls all refer to information obtained from the Roper Center.

The data collected allow analyses of differences among respondents in both the degree of crystallization of opinion and individual levels of seriousness. We draw an important distinction between having an opinion and the content of an opinion that is expressed. Holding an opinion expresses at least a minimum degree of attention to the topic in question and imparting some importance to it. In short, if you do not care enough to know about something and have not formed an opinion, the topic is not important to you. In contrast, for persons who hold opinions the direction of that opinion is important. Throughout this and the remaining chapters, for each topic addressed, we will investigate both the holding of opinions and the directions of opinions held.

On the Meaning of "Seriousness"

"Seriousness" ratings have been used in studying a variety of public issues ranging from crime to the weather. Although there is no commonly accepted standardized meaning to a rating such as "very serious," and therefore one may suspect that one individual's use of that rating may mean something quite different from another's, these ratings have proved very useful. Apparently, there is enough commonality across individuals in the meaning of seriousness to provide very useful and robust findings.

A "serious" problem is one that is troubling: Respondents rarely, if ever, regard some positive condition as "serious" -- high levels of employment are never regarded as serious. Furthermore although one respondent's "very serious" may be equivalent to another's "somewhat serious", both may order identical problems in the same way.

It is instructive to consider the history of research on the seriousness of crime. The perceived seriousness of crimes have been studied extensively over the past 30 years. In survey after survey, the average seriousness ratings given to various crimes provides an invariant rank order of those crimes[2]. In other words, despite whatever idiosyncratic interpretations may be given to the ratings, the ordering of crimes remains the same: Homicide is regarded as more serious than assault which in turn is seen as more serious than shoplifting and crimes that are closer in seriousness tend to maintain the same rank ordering.

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[2] Peter H. Rossi and J. Patrick Henry "Seriousness: A Measure for all Purposes?" in Malcolm W. Klein and Katherine S. Teilman (Eds.), Handbook of Criminal Justice Evaluation

We believe that this approach can also be beneficially used with respect to environmental issues, as the findings in this chapter document.

Levels of Seriousness

Table 4.1 presents the seriousness ratings given by our respondents to five environmental problems facing their local communities and the Commonwealth. Panel A contains the seriousness ratings given to each of five local environmental issues and Panel B ratings for the same issues for the state as a whole. The right hand column contains average seriousness ratings: the higher the average, the more serious the problem. Many responded to these seriousness questions that they did not know how serious the problems were: The percentages registering "don't know" are shown as the middle column of Table 4.1, expressing the fact that their opinions place them in the "center position" on the continuum of seriousness, neither regarding the problems as serious or as not serious.

There are several salient findings in Table 4.1:

First, with one exception, all of the local and state environmental problems are regarded by a near majority of respondents as either very serious or somewhat serious. Solid waste disposal, acid rain damage, and waterway pollution are seen as major problems both on the state and local levels, along with air pollution on the state level. The only environmental problem that is not regarded as serious by a majority (or close to a majority) is local air pollution, rated as very or somewhat serious by less than two-fifths (38%) of the respondents.

Second, the problem regarded as most serious locally and statewide is the pollution of

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(Beverly Hills: Sage Publications, 1980). Peter H. Rossi, Jon E. Simpson and JoAnn L. Miller "Beyond Crime Seriousness: Fitting the Punishment to the Crime," , Journal of Quantitative Criminology, Vol. 1, No. 1 (1985), pp. 59-90.

streams, lakes and coastal waters: almost nine out of ten (87%) regard this form of pollution to be a very or somewhat serious state problem and two out of three (67%) give those ratings to this issue as a local problem.

Third, there are two issues on which fairly large proportions of respondents did not venture seriousness ratings. Especially large numbers of respondents, one in four (24%), did not give ratings of either state or local acid rain damage, claiming that they did not know how serious that problem was. The problem of solid waste disposal was also not rated by fairly sizable proportions of respondents: 15% gave no local ratings and 17% gave no state ratings.

Fourth, each problem is regarded to be more serious as a state problem compared to its local manifestation. The average seriousness ratings for each environmental problem on the state level are considerably higher, reflecting the fact that sizable majorities regard each state problem as very or somewhat serious[3].

In sum, both local communities and the state as a whole are viewed as facing serious environmental problems, with the problems being viewed as especially acute for the state as a whole. An interesting exception to this view is local air pollution, regarded as a serious problem by a minority of our respondents. Large numbers of respondents appear to be undecided about the danger of acid rain and solid waste disposal and express that indecision by refusing to venture opinions of the seriousness of those problems.

It is difficult to assess and interpret the meaning of the differences among problems and the difference between the seriousness of the same issues as local and as state problems. Especially puzzling is the discrepancy between air pollution as a local and as a state problem. Perhaps the answer lies in the fact that local conditions are directly experienced while few residents have enough direct experiences with the variation that exists across a state that is highly urbanized but also contains portions that are rural and lightly settled. The perception of state problems may be responsive to the attention given in the mass media. In addition, some environmental problems are more easily perceived through direct experience while other require instruments to detect. Air pollution may be experienced directly when it results in irritating smog but not as easily in other forms. Another interpretation is that the respondents realize that each environmental problem has its primary impact on some but not all local communities. Hence summing across the communities that make up the state, all problems are more serious when so integrated.

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[3] A similar finding has been shown in some of the national surveys in which people were asked to rate the seriousness of hazardous wastes in their locality and also the seriousness of that problem nationally. Local problem manifestations are uniformly viewed as less serious than national problems.

Table 4.1: Perceived Seriousness of Local and State Environmental Problems
[N=500]

A. In Respondents' Cities or Towns

Environmental Issue	Very	Some what	Don't know	Not Ser	No Prob	Average* Seriousness
	Perceived Seriousness					
Air Pollution	14.2	24.2	3.8	36.0	21.8	5.5
Solid Waste disposal	26.4	24.2	14.8	17.2	17.4	6.5
Acid rain damage	20.4	28.0	23.8	17.0	10.8	6.6
Lake, stream or coastline pollution	32.0	34.7	1.2	20.0	12.1	7.1

B. In Massachusetts as a Whole

Environmental Issue	Very	Some what	Don't know	Not ser	No Prob	Average* Seriousness
	Perceived Seriousness					
Acid rain damage	32.8	33.6	23.6	6.2	3.0	7.7
Air pollution	33.2	40.6	9.8	12.6	3.8	7.7
Solid waste disposal	47.4	27.2	17.0	5.4	3.0	8.2
Lake, stream or coastline pollution	58.4	28.6	6.6	3.6	2.8	8.7

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* Average computed by giving numerical values 10 through 2, respectively, left to right, to the answers to these questions shown in the column headings of this table. Hence the higher the average score, the more serious is the problem perceived.

From our search of the Roper Survey Archives at the University of Connecticut, it is apparent that environmental issues have been a very frequent topic for national surveys[4]. A search for questions on that topic asked in the past five years uncovered several hundred questions, of which those most comparable to our study's items will be presented throughout this report.

Table 4.2 contains national survey findings derived from questions that ask about the perceived seriousness of various environmental problems and from questions probing issues closely related to seriousness. There is an overall patterning to the national survey results that resembles quite closely the findings from the Massachusetts DEQE Household Survey: When asked about the same problem, the national public shows the same magnitude of concern and seriousness as was shown earlier from our state survey. For most problems -- exceptions being acid rain and automobile-induced air pollution -- strong majorities either consider water pollution, solid waste disposal and hazardous wastes to be either very serious, "one of the most serious", or causing considerable concern. Lack of strict comparability among the several surveys and with the present survey cannot support any judgment whether Americans generally regard problems more or less serious than the Massachusetts citizenry. Nevertheless, it is clear that our state is not alone in registering a high level of concern about environmental problems.

It should be noted that considerably fewer respondents in the national surveys could not register opinions and claimed "don't know". As explained earlier, we believe this difference is due to the fact that we did not encourage our interviewers to try to "force" respondents to give opinions.

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[4] No state or local sample surveys that dealt with environmental issues were on file in the Roper Center archives. Of course, this negative finding does not mean that state or local surveys were not undertaken, but only that whatever organization may have done so either does not send their surveys to the Roper archives or chose not to send the surveys in question.

Table 4.2: Levels of Concern with Environmental Problems Registered in Recent National Surveys

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A. 1985 Roper Organization National Surveys

"Here are things that environmentalists have said are problems...Tell me whether you think it is one of our most serious environmental problems, or no more serious than other environmental problems, or one of our least serious environmental problems?"

	One of Most Serious	No More Than Oth.	Least Serious	Don't know
Acid Rain	48%	26%	9%	17%
Oil Spills	55%	33%	9%	4%
Water Pollution by Manufact. Plant	75%	20%	2%	3%
Air Pollution, Auto	36%	44%	16%	3%
Air Pollution, Ind.	58%	32%	7%	4%
Contamination, Chemical Waste	76%	17%	3%	4%
Contamination Nuclear Waste	68%	19%	6%	7%
Radiation, Nuclear Plants	57%	21%	15%	8%

B. 1986 Louis Harris and Associates National Survey

"Please tell me if .... is currently a very serious problem, a somewhat serious problem, only a small problem, or not a problem at all."

	Very Serious	Somewhat Serious	Small Problem	No Problem	Don't Know
Hazardous waste	68%	24%	5%	1%	2%
Nuclear Waste	49%	30%	15%	4%	2%
Water Pollution From Factories	65%	28%	5%	1%	1%
Contaminated water	55%	31%	11%	2%	1%
Air Pollution From Coal Plants	30%	45%	18%	4%	3%
Acid Rain	42%	37%	13%	4%	4%

Table 4.2 (cont'd): Levels of Concern with Environmental Problems Registered in Recent National Surveys

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C. 1988 Gallup Organization National Survey

"If '6' represents someone who is extremely concerned about something and '1' represents someone who is not at all concerned about something, where on this scale of '6' to '1' would you place yourself in terms of your concern for...."

Degree of Concern	Ocean Dumping	Drinking Water Pollution	Air Pollution	Disposal of Household Trash
6-Extreme concern	66%	66%	50%	41%
5	17%	18%	23%	19%
4	8%	8%	13%	17%
3	4%	5%	8%	13%
2	2%	1%	3%	5%
1-No concern	2%	1%	2%	3%
No Opinion	1%	1%	1%	2%

The Perceived Quality of Domestic Water

The DEQE Household Survey also asked respondents to rate the "taste quality" of their domestic water supply. The responses to this question are especially interesting in this context because the ratings present a stark contrast to the more remote environmental problems considered in the last section.

Table 4.3 presents the ratings respondents made of their "drinking water". The ratings were obtained on a scale ranging from 1 to 10[5], representing a continuum from the "best" quality to the "worst". Making the arguable assumption that high ratings would be equivalent to serious problems, Table 4.3 indicates that domestic drinking water presents a serious problem to only a decided minority of the respondents, the close to one in five (22%) who gave ratings between 7 and 10. Most of the respondents are clustered in the highest quality categories, almost one in four (23%) giving ratings of 1 or 2 and close to one in three (30%) with ratings of 3 or 4.

In short, the taste quality of domestic water supply apparently presents no problem to the majority of our respondents. Of course, within limits, the acidity of their water supplies may not be detected by tasting, nor is the presence of moderate amounts of coliform bacteria. Tasting may not be a good test: in this case, direct experience may be misleading.

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[5] The ratings were actually obtained with 10 representing the best and 1 the worst qualities. The ratings were reversed in Table 4.2 to obtain comparability to the seriousness ratings considered in the last section.

Table 4.3: Perceived Quality of Drinking Water Taste

Rated "taste quality of your drinking water"

Scores	Percent
Worst - 9-10	12.8%
7-8	9.2
5-6	19.0
3-4	30.4
Best - 1-2	23.0
Don't know	5.6
Average[a] score =	2.67
N=	[500]

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[a] Computed excluding "don't know" responses. Note that score values are reversed from those shown on the questionnaire in the Appendix.

The Most Pressing Environmental Problems

The seriousness ratings discussed previously provide one measure of the importance accorded to each of the problems discussed. Yet the crudeness of the measures do not allow one to distinguish which may be more salient among two equally seriously rated problems. In order to get at this viewpoint, the respondents were asked directly to designate the most pressing of the environmental problems facing, respectively, their local communities and the entire state. The resulting two rank orders are presented in Table 4.4.

The question asked about six environmental problems, requiring the respondent to pick out the single "most pressing". Several salient features of the findings are as follows:

First, the choices for local problems are more differentiated: That is, there is more consensus on the most pressing local problem than there is for the most pressing state problem. The three highest ranking state problems have been chosen by percentages that are but five points apart, whereas the top three local problems are nine points apart, indicating more consensus and differentiation concerning local problems.

Second, the most pressing local problem concerned the quality and adequacy of drinking water supplies whereas the most pressing state-level problem is the pollution of lakes, streams and coastal waters. The second most frequently chosen problem, solid waste disposal, was elected into that position both as a local and a state problem. Drinking water supplies ranks fourth as a state problem and first as a local problem.

Given the findings in Table 4.3 that respondents rate the "taste quality" of their drinking water supplies to be quite good, it seems reasonable to speculate that it is the adequacy of local drinking water supplies that leads our respondents to give this problem the highest ranking. Indeed, given the concern expressed by public officials concerning the effects of the dry winter of 1988-1989 on the drinking water supply for the state, the high importance given to this issue is understandable.

Finally, in the respondents' views, the environmental problems that are least pressing include the protection of wetlands and air pollution, both in last places (5 and 6) both as state and local problems.

Table 4.4: Perceived Main Environmental Problem Facing Local Communities and Facing the State

	Most Pressing Environmental Problem			
Problem	Local	Rank	State	Rank
Quality and adequacy of drinking water supplies	24.0	(1)	15.2	(4)
Solid waste disposal	21.6	(2)	18.2	(2)
Lakes, streams, coast Pollution	15.4	(3)	20.0	(1)
Hazardous wastes disposal	10.8	(4)	17.8	(3)
Wetlands protection	10.0	(5)	4.8	(6)
Air pollution	7.4	(6)	9.8	(5)
Other	.8		.4	
Don't know	9.8		13.8	
N=	[499]		[500]	

Respondent Variation in Seriousness

In this section, we shift our attention away from overall patterns in perceived seriousness to examine differences among respondents in those respects. There are two main issues to be addressed: First, what are the regional and socio-economic differences among those who have many opinions on the seriousness of the five environmental issues addressed in the second section and those who have few opinions. Second, what are the corresponding differences among respondents who perceive the environmental problems as more serious as compared to those who consider them to be less serious. We will treat the perceptions of local problems separately from those of state problems.

There are many ways in which each respondent differs from any other respondent. Although this diversity is rich, its complexity poses problems. If older persons regard the pollution of waterways as less serious than younger ones, that finding may be an important consequence of aging or it may simply reflect the many ways in which the two age groups otherwise differ. For example, as we saw in an earlier section, older persons use the environment much less frequently as swimmers and fisherpersons and hence may not either observe directly the effects of water pollution or simply not care as much because their recreational activities do not involve the lakes, streams and coastal beaches. This complexity calls for the use of analysis strategies that can accommodate many simultaneous comparisons, allowing one to isolate the differences among age groups, holding constant those differences that can be attributed to variations in location, income, recreational practices, and so on.

In this section we employ a statistical method -- multiple regression -- that enables such multiple simultaneous comparisons. We will examine the effects of regional location, recreational practices, educational attainment, age and several other important potential differences among our respondents. The differences that we find to be significant will be "net effects", namely effects that remain after those of the other respondent characteristics considered are removed.

Local Environmental Problems.

Of particular interest to the DEQE with regard to local problems is whether respondents in different regions perceive the presence of problems in the same proportion, and whether the seriousness of those problems varies by region. If the seriousness of problems differ from region to region then DEQE outreach efforts need to be tailored in order to deal with those problems. However, when we examine the regional differences, few differences can be found either in the numbers of opinions held on local problems, or in how serious the problems are perceived.

As can be seen in Panel A of Table 4.5, only very small differences can be seen between regions in the average number of opinion respondents offered toward local problems. That is, on each of the 4 local problem areas discussed, respondents from all of the regions were equally likely to offer an opinion as to the seriousness of those issues. What small differences we do find are not statistically significant.

Similarly, as can be seen in Panel B of Table 4.5, when we examine the average perceived seriousness for the local problems, only small differences can be seen between the various regions. Only the Southeast Region shows a differences of any magnitude, with the perceived seriousness being slightly more than .5 points less than the Northeast. Again, note that when comparing perceived seriousness between respondents from the various regions, these differences are not statistically significant.

Table 4.5: Average Opinions Held on the Local Environmental Problems and Their Perceived Seriousness By DEQE Regions

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A. Holding Of Opinions on Local Problems

	Number of Opinions Held	Std. Dev	[N]
State Total	3.80	.48	[500]
DEQE REGION			
Northeast	3.77	.51	[229]
Southeast	3.83	.43	[103]
Central	3.81	.53	[100]
West	3.85	.40	[68]

B. Perceived Seriousness Of Local Problems

	Perceived Seriousness[a]	Std. Dev	[N]
State Totals	6.43	1.88	[481]
DEQE REGION			
Northeast	6.62	1.87	[220]
Southeast	6.08	2.07	[97]
Central	6.28	1.70	[100]
West	6.57	1.83	[64]

Differences between regions not statistically significant.

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[a] High score is serious.

In undertaking a multiple regression analysis of this sort, it is critical to use respondent characteristics that one can expect on a priori grounds to be related to the whatever it is one is trying to explain. Hence the factors used in Table 4.6 are reasonable to expect to affect both the holding of opinions and the ratings of perceived seriousness. Clearly, problems vary by residential location and hence we enter the DEQE region in which the respondent lives. We also consider use of the environment, the problems respondents have in disposing of wastes and respondents' proximity to potentially noxious land uses. Finally, we consider respondent biographical factors, such as age, household income, tenure, sex and marital status, all indicators of significant life course events.

Table 4.6 deals with variations in opinion holding and perceived seriousness of local problems. In the left hand column are numbers that index the effects of the respondent characteristics represented in each row: these numbers are standardized regression coefficients. It is important properly to understand how these coefficients should be interpreted. First, those coefficients that have asterisks are ones that are statistically significant; that is, they are much larger (in an absolute sense) than we can expect by chance. Hence these are the coefficients to which we primarily shall be attentive. Correspondingly, those coefficients that have no asterisks are not statistically significant. For example, as shown in the left hand column, educational attainment is significantly positively related to holding opinions about the seriousness of local environmental problems; that is, the higher the educational attainment of the respondent the more opinions are held by that respondent. In contrast, none of the coefficients for residence in DEQE regions have asterisks, indicating that once we take into account the other ways in which respondents differ, any differences among people who live in different regions are wiped out[6].

Second, the coefficients are "net" of all the other variables in the column. Thus, educational attainment affects opinion holding, regardless of region, recreational, and all the other characteristics in that column.

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[6] Of course, in this case there were no significant differences in seriousness among DEQE regions to begin with.

Third, the sizes of the coefficients are roughly in proportion to their importance in explaining the variable in question. For example, in the first column of Table 4.6, the educational attainment levels of the respondents are the most important factor in explaining their holding of opinions concerning the seriousness of local environmental problems.

Finally the last entry in each column, R^2, is a measure of how well all of the factors included in a column taken together explain the variable in question. Hence, if we compare the two entries in the last row, it is clear that the seriousness ratings are better explained than the holding of opinions; that is .11 is larger than .08.

The first (left-hand) column of Table 4.6 is concerned with trying to explain the holding of opinions on the seriousness of local environmental problems. The dependent variable is a count of the number of opinions held on the four questions concerning local environmental problems (see Table 4.1 for the four environmental problems). Scores on this variable can range from 0 to 4. If a respondent said "don't know" to all four items, the score for the variable would be zero (0). As can be seen from the number of column entries with asterisks, there are only three significant factors that we could find[7] to be related to the holding of opinions concerning local environment problems, namely educational attainment, length of residence and recreational practices The higher the educational attainment, being a resident for two or more years, and engaging in swimming and/or fishing all predispose respondents to offer opinions on the seriousness of local environment issues.

The role of educational attainment in this and other tables to be presented in this report needs some comment. For most of the respondents, formal education ended a decade or more in their past. Hence, the content of educational experience per se probably plays only a small part. More important are the skills in handling the written and oral language that are produced by a prolonged exposure to formal education. Entry into the higher reaches of the occupational world for which educational attainment may be a prerequisite also maintains those skills into the adult years. Accordingly the better educated read more and read more widely than the less well educated and hence by being better informed, are more likely to have opinions, especially on public issues. Note that education usually does not influence the content of opinions as much as their formation: accordingly, the coefficient for educational attainment is higher in the left hand than the right hand column.

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[7] The characteristics of the respondents used in this equation obviously do not fully explain the holding of opinions. This means that there are other, unmeasured characteristics that play roles, about which we can say little, if anything, from the findings of this study.

It is also important to note the factors that played no significant role in having opinions about seriousness. Of special interest is that fact that the DEQE regions in which respondents live play no roles. Nor do measures of the respondent's proximity to potentially noxious land uses (i.e. having nearby factories, gas stations, landfills and sewage treatment plants) or the measure of the respondents' waste disposal needs (i.e. changing one's oil, having a septic tank, well water supply, and having building and/or painting wastes to dispose of). Other factors that play no role include, sex, age, household income, whether a renter or an owner and marital status.

The second (right-hand) column of Table 4.6 is an analysis of the variations in the level of seriousness of local environmental problems perceived by the respondents. To measure this we averaged the seriousness ratings given to local environmental issues by each respondent, using these averages as the variable to be explained.

Although slightly more of the variation in seriousness is explained than in the first column, there are only four respondent characteristics that reach statistical significance. First, residents of the Southeast Region, when other factors are controlled for, give lower average seriousness ratings to local problems compared to those persons in other regions. Second, respondents who live close to noxious land uses give higher seriousness ratings. Third, the more highly educated respondents give higher seriousness ratings. Finally, older persons give lower ratings.

When we consider the sizes of the significant coefficients, it is clear that age plays a more important role than all the others, followed by proximity to noxious land uses, with educational attainment and residence in the Southeast Region of about equal but lowest importance.

Table 4.6: Regressions of Holding Opinions on the Local Environmental Problems and Their Perceived Seriousness

[Entries are Standardized Regression Coefficients]

	Dependent Variables	
	Number of Opinions Held Beta[a]	Seriousness of Local Problems Beta[a]
Region[b]		
Western Reg.	.07	.02
Southeast Reg.	.04	-.10*
Central Reg.	.00	.09
Respondent and Environment		
Fishes, swims	.12**	.00
Waste Practices[c]	.06	.09
Land use index[d]	-.04	.12*
Respondent		
Education	.13**	.10*
2+ yrs resident	.10*	-.08
Female	-.08	.08
Married	.02	-.07
Homeowner	-.00	.04
Age (yrs.)	-.09	-.16**
Household Income (K)	-.05	.00
R^2 =	.08***	.11***
N=	[494][e]	[494]

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[a] The number of asterisks after each beta coefficient are to be interpreted as follows: "***" results significant at p=.001 or better; "**", p=.01; and, "*", p=.05. Hence "***" means that a beta this large or larger would occur in less than one sample out of every thousand random samples of this size.

[b] Binary variables. Omitted region is Northeast.

[c] An index that is a count of the number of potentially risky household waste disposal practices, such as using a septic tank, changing crankcase oil, etc.

[d] An index that is a count of the number of potentially noxious land uses within a half mile of the respondents, including factories, gas stations, landfills, and sewage treatment plants.

[e] N excludes persons from whom no information was obtained on any of the independent or dependent variables.

State Environmental Problems

Tables 4.7 and 4.8 concern perceptions of state environmental problems. In Panel A of Table 4.7, the average number of opinions held on state problems is presented for each of the DEQE regions. Once again we find that when examining only the variations between regions there are virtually no differences in the number of opinions held. The region of the respondents residence has no effect on whether the respondent perceives that a problem exists.

Similarly, as we can see in Panel B of Table 4.7, the perceived level of seriousness does not vary significantly between regions. Indeed, although the state problems are perceived, overall, as being highly serious, the variation in perceived serious between regions is very small, with less than 2 tenths of a point separating the region with the highest seriousness rating for state problems (8.20 on the 10 point scale for the Central Region) and the region indicating the lowest average seriousness rating for state problems (8.01 for the Northeast region).

Table 4.7: Average Opinions Held on the State Environmental Problems and Their Perceived Seriousness By DEQE Regions

A. Holding Of Opinions on State Problems

	# Opinions Held	Std. Dev	[N]
State Totals	3.43	.92	[500]
DEQE REGION			
Northeast	3.45	.88	[229]
Southeast	3.36	1.00	[103]
Central	3.48	.94	[100]
West	3.38	.95	[68]

B. Perceived Seriousness Of State Problems

	Perceived Seriousness	Std. Dev	[N]
State Totals	8.10	1.56	[500]
DEQE REGION			
Northeast	8.01	1.57	[229]
Southeast	8.17	1.61	[103]
Central	8.20	1.49	[100]
West	8.10	1.60	[68]

Differences between regions not statistically significant.

In Table 4.8, the results from the multiple regression analysis on the perceptions of seriousness of state problems are presented. Note that these two equations have higher R^2 coefficients than those in Table 4.6, indicating that holding opinions concerning state level problems and the perceptions of their seriousness are more highly structured than orientations toward local environmental problems. A reasonable interpretation is that there are variations in local situations while the state as a whole may be regarded more uniformly. In addition, in this table all the respondents are referring to the same object, the state of Massachusetts, whereas in the previous tables they were referring to their local communities among which there is undoubtedly considerable variation.

The left-hand column of Table 4.8 refers to the number of opinions held by respondents concerning state environmental problems. In this column, there are four respondent characteristics that are significantly related to the holding of opinions. First, the better educated tend to hold more opinions than the less well educated, a finding similar to that of Table 4.6 and with much the same interpretation: better educated persons are more well informed on public issues.

Second, almost as strongly related to the holding of opinions is the index of "waste practices," a measure of the number of household practices that increase reliance on environmental factors, using a well for water, changing automobile oil, having a septic tank, and having need to dispose of building materials and painting wastes. The greater the number of such practices, the more opinionated the respondents. A reasonable interpretation of the influence of this factor is that such household practices makes persons involved more aware of their dependence on the environment and hence more motivated to form opinions on such issues.

Third, using the environment for recreational purposes predisposes one to have more opinions. Since our measures of recreational use involve engaging in swimming and fishing, and hence the use of waterways and beaches, the latter being regarded as the most serious problem facing the state, it is understandable why those recreational practices should lead to heightened awareness of state environment problems.

Finally, older persons are less likely to hold opinions than younger persons. It might be tempting to interpret this finding as indicating lower levels of use of the environment by older persons. However, since the equation includes the swimming and fishing measures, this interpretation is weakened. An alternative interpretation rests upon the differences in biographical experiences that mark off age groups. The older persons grew up in historical periods in which environmental issues did not appear to be as pressing as in the present. It may also be the case that they are more accustomed to the degradation of the environment: After all, for most of their lives, waterways -- such as the Connecticut River -- were more polluted than at present. It may be that with the perspective of seeing improvements in their lifetimes, older persons may wonder what the "fuss is all about".

It is important to note that there are many factors included in the left hand column that do not have significant coefficients: Residence in one or another DEQE region has no significant influence. Nor does proximity to potentially noxious land uses, in contrast to the findings of Table 4.6. Length of residence, sex, marital status, being a homeowner and household income also are not significant.

The second (right-hand) column of Table 4.8 refers to the average perceived seriousness of state environmental problems. A slightly different configuration of significant factors can be discerned. First, being a homeowner inclines one to consider the environmental issues as more serious. Indeed, it is puzzling that this respondent characteristic is important for state level problems and not for local level problems. No convincing interpretation comes easily to mind.

Second, the two major factors consist of ones that connect the respondent more closely to the environment, namely recreational practices and waste practices. Swimmers and fisherpersons are more likely to think the state level problems are more serious. Surely that reflects the fact that the pollution of state waterways and beaches are seen as the most pressing environmental problem facing the state. The waste practices index is more puzzling, indicating that the more reliance one must place on the environment and the more one has special waste disposal problems, the more serious state level problems generally are seen to be.

Finally, education affects perceived state level seriousness. The more educated the respondent, the more serious state problems are seen to be.

Table 4.8: Regressions on Holding Opinions on the State Environmental Problems and Their Perceived Seriousness

[Entries are Standardized Regression Coefficients]

	Dependent Variables	
	Number of Opinions Held	Seriousness of State Problems
	Beta	Beta
Region[a]		
Western Reg.	-.02	-.03
Southeast Reg.	-.04	.02
Central Reg.	-.03	-.00
Household Behavior		
Fishes, swims	.15**	.12*
Waste Practices[b]	.18***	.16**
Land use index[c]	.02	.00
Respondent		
Education	.19***	.12*
2+ yrs resident	.01	-.03
Female	-.04	.08
Married	-.02	-.04
Homeowner	-.00	.13*
Age (yrs.)	-.14**	-.05
Household Income (K)	-.01	.01
R^2 =	.17***	.11***
N=	[494][d]	[494]

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[a] Binary variables. Omitted region is Northeast/Boston Metropolitan.

[b] An index that is a count of the number of potentially risky household waste disposal practices, such as using a septic tank, changing crankcase oil, etc.

[c] An index that is a count of the number of potentially noxious land uses within a half mile of the respondents, including factories, gas stations, landfills, and sewage treatment plants.

[d] N excludes persons from whom no information was obtained on any of the independent or dependent variables.

The Seriousness of Combined State and Local Problems

Because the questions tapping state and local levels are identical in form, it is possible to combine the answers to the two sets of questions and to come up with an overall average perceived seriousness of environmental problems based on the eight questions involved[8]. This variable may be regarded as a measure of the perceived overall seriousness of environmental problems.

As can be seen in Table 4.9, when we examine the perceptions of seriousness for environmental programs overall, there are, again, no statistically significant differences in the perceived level of seriousness toward environmental issues between respondents from the different regions in the Commonwealth. The overall levels of perceived seriousness toward environmental problems are consistent throughout the state.

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[8] The correlation between the perceived serious of local environmental problems and state level perceived seriousness is a modest .54, indicating that respondents distinguished between the two levels at the same time linking them together.

Table 4.9: Average Overall Environmental Seriousness By DEQE Regions

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Overall Environmental Seriousness

	Perceived Seriousness	Std. Dev	[N]
State Totals	7.27	1.51	[481]
DEQE REGION			
Northeast	7.33	1.51	[220]
Southeast	7.14	1.63	[97]
Central	7.24	1.39	[100]
West	7.34	1.54	[64]

Differences between regions not statistically significant.

Using the same variables used previously in tables 4.6 and 4.8, Table 4.10 presents the results of the analysis of the combined measure. Four respondent characteristics have significant coefficients in this table. First, age appears to be the second strongest correlate of combined seriousness, older persons perceiving lower seriousness ratings than younger ones. Second, sex is significant with women regarding environmental problems as slightly more serious than men. Third, education plays its usual role, with the better educated perceiving environmental problems as more serious. Finally, the waste practices index plays the strongest role: the more a respondent relies on the environment, the more pressing are the problems.

Table 4.10: Regression of Perceived Seriousness of Combined State and Local Environmental Problems

[Entries are Standardized Regression Coefficients]

	Seriousness of Combined State and Local Problems Beta[a]
Region[b]	
Western Reg.	-.02
Southeast Reg.	-.05
Central Reg.	-.05
Household Behavior	
Fishes, swims	.06
Waste Practices[c]	.14**
Land use index[d]	.07
Respondent	
Education	-.12**
2+ yrs resident	-.07
Female	.09*
Married	-.06
Homeowner	.09
Age (yrs.)	-.13**
Household Income (K)	.00
R^2 =	.10***
N=	[494][e]

---

[a] The number of asterisks after each beta coefficient are to be interpreted as follows: "***" results significant at p=.001 or better; "**", p=.01; and, "*", p=.05. Hence "***" means that a beta this large or larger would occur in less than one sample out of every thousand random samples of this size.

[b] Binary variables. Omitted region is Northeast/Boston Metropolitan.

[c] An index that is a count of the number of potentially risky household waste disposal practices, such as using a septic tank, changing crankcase oil, etc.

[d] An index that is a count of the number of potentially noxious land uses within a half mile of the respondents, including factories, gas stations, landfills, and sewage treatment plants.

[e] N excludes persons from whom no information was obtained on any of the independent or dependent variables.

Chapter 5

Popular Views of DEQE and Environmental Programs

Introduction:

In this chapter, we will consider how the citizens of the Commonwealth regard the DEQE and its programs. We will first be concerned with how well known the DEQE is to the general public and then consider how well (or poorly) its programs are regarded.

Everyone is familiar with the use of sample surveys of the general public to obtain assessments of how well public officials, agencies and programs may be doing. Political pundits watch carefully the ups and downs of ratings of the President's performance interpreting each shift in the light of the previous month's presidential speeches, macro-economic changes, and shifts in the foreign policy arena. That there are shifts in assessment levels cannot be denied. However, it is not clear how to interpret them. Public opinion on political issues and political persons, especially on the national level, generally is not based on direct personal experience with the persons and problems being assessed. For example, no one directly experiences an unemployment rate; one is either employed or not and knows directly of the employment circumstances of relatives, friends and neighbors. Reading or hearing about the monthly press release from the Bureau of Labor Statistics is how we learn about the current unemployment rate, which may or may not conform to our direct knowledge of the employment circumstances in our social milieu.

For national issues, the mass media clearly intervene between the ordinary citizen and the arena of national political decision making. For local and state issues, direct experience can be expected to play a more important role. Still, the mass media are important for these arenas as well. The assessments of the Commonwealth's environmental programs that will be discussed in this chapter can be interpreted as partially influenced by the citizens' direct experiences with the problems in question and with the agencies involved and as partially in response to the treatment given to both in the mass media. Hence whatever problems may be uncovered for the DEQE in this chapter's findings may be met at least in part by compensatory changes in agency procedures and activities and by influencing how the DEQE is treated by the mass media.

Recognition of DEQE

The Department of Environmental Quality Engineering is an agency that through its programs touches directly and indirectly on the activities of virtually every Commonwealth citizen. Direct experience is widespread. Everyone whose car bears a Massachusetts license plate is touched (and sometimes negatively) by the annual motor vehicle emissions testing program: Nine out of ten (93%) respondents own at least one car. Indirect experience can arise out of any of the other DEQE programs. Although the DEQE does not collect trash and garbage, its Solid Waste Disposal program affects the charges levied for local garbage and trash collection. Certainly, local newspapers carry frequent accounts of DEQE local actions regarding wetlands, solid waste disposal and local bodies of water.

It should therefore prove to be no surprise that most of our respondents recognize its name. As shown in Panel A of Table 5.1, three out of five (60%) have "heard of the Department of Environmental Quality Engineering" and another one in five (20%) recognized its initials, "DEQE". The remaining one in five could not recognize the agency's full title or its initials. Indeed, if there is any wonderment over these findings, it will be over why these proportions are not higher, given the ubiquitous nature of DEQE programs.

The dependence of popular knowledge of DEQE on press, television and radio coverage of its activities is shown in Panel B of Table 5.1. We asked each respondent who knew about DEQE how each had first heard of the agency. Almost half (46%) claimed to have first heard about DEQE through news articles on television or radio programs or in newspaper articles or advertizing. Another frequent impersonal source are signs on buildings and roads, cited by almost one in five (18%).

The remainder of our respondents had either direct personal contact with the DEQE (20%) or through "word of mouth" from friends, relatives and co-workers (13%). All told one in three respondents either had direct experience with the agency or learned about DEQE through their social networks.

The nature of the direct experiences of respondents with DEQE is tabulated in Panel C of Table 5.1. A majority (61%) had some direct "business" with the agency, amounting to almost one in eight (12%) of all persons who knew about DEQE. One in twenty (5%) had direct contact with DEQE either through a complaint initiated by themselves or a complaint registered against them[1].

The remainder of the direct personal contacts with DEQE occurred through educational or public forums of one sort or another, occasions at which DEQE representatives presumably were present.

In short, for most of our respondents DEQE is a media presence in their lives, its actions being the content of some of the television, radio or newspaper content to which they are exposed. For a significantly large minority, the DEQE is a presence either directly through personal contact or through their social networks.

Our survey cannot assess directly the amount and quality of the knowledge of DEQE held by our respondents. The only question that tests that knowledge is shown in Panel D of Table 5.1, asking whether respondents were aware that "DEQE had four regional offices throughout the state for dealing with environmental issues". Less than one in ten (9%) claimed to be aware of the four regional offices. It is difficult to assess what this level means; on the one hand, the measured knowledge level is quite low. On the other hand, it is not clear that this particular bit of knowledge is critical for any purpose. After all, one need not be aware that there are any regional offices of DEQE in order either to understand DEQE activities or to initiate contact with DEQE -- any Massachusetts telephone directory provides the necessary information. In addition, we cannot tell whether our respondents answered in terms of the number of DEQE regional offices or in terms of any regional office.

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[1] We suspect that some of the "business" reported are also complaints leading to an underestimate of the complaint levels reported here.

Table 5.1: Knowledge of DEQE and Sources of Knowledge

A. Knowledge of DEQE

Item[a]	Percent
Has heard of "The Department of Environmental Quality Engineering"	60.0
Has heard of "DEQE"	20.4
Has never heard of either	19.6
N=	[500]

B. Source of Knowledge of DEQE

Source[b]	Percent
TV, newspaper or radio	45.3
Advertisement in media	0.7
Friends, relatives or co-workers	12.7
Saw signs on buildings/roads	17.9
Personal experience	19.9
Other	1.0
Don't know	2.5

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[a] Respondents were first asked "Have you ever heard of the Massachusetts Department of Environmental Quality Engineering?" If respondent claims not to have heard of the Department, a follow-up question asked, "Sometimes the agency is talked about as the DEQE - Have you ever heard of the DEQE?"

[b] Asked only of persons who had heard of DEQE,

Table 5.1 (Cont'd): Knowledge of DEQE and Sources of Knowledge

C. Nature of "Personal Experience with DEQE[c]

Experience	Percent
Educational or Public Forum	16.3
General business with DEQE	61.3
Respondent Complaint to DEQE	3.8
Complaint against respondent	1.3
Other	16.3
Don't know	1.3

D. Knowledge of DEQE Regional Offices

Knows DEQE has four regional office throughout state	8.6%

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[c] Asked only of respondents who claimed to have heard of DEQE through personal experience with the agency.

Who Knows About DEQE?

Using the responses shown in Table 5.1, we constructed an index with scores ranging from 2, given to those who recognized the full DEQE name, 1 to those who recognized only its initials and 0 for those who did neither. In Table 5.2, we find that those residents living in the Central region show significantly higher levels of recognition of the DEQE than respondents in any of the other regions. Almost three out of four (73 percent) of respondents from the Central Region recognized the DEQE by its full name. In each of the other regions, less than 60 percent of all respondents recognized the DEQE by full name. In addition, only 11 percent of the respondents from the Central Region did not recognize the DEQE by either the initials or the full name. In contrast, almost 20 percent of the respondents in the Northeast Region had never heard of the DEQE, while one in four of those respondents from the West and the Southeast Regions were unaware of the DEQE (24.3 and 25.0 percent, respectively). Differences in the average DEQE Knowledge scale further emphasize these differences, with respondents from the central region averaging almost one third of a point higher in the recognition score than those persons from other regions (differences significant at .05).

Table 5.2: Knowledge of DEQE By DEQE Regions

Knowledge Of DEQE	REGION			
	Northeast	Southeast	Central	West
Know Full Name	55.5%	58.3%	73.0%	58.8%
Know DEQE Initials	24.9%	17.5%	16.0%	16.2%
Do not know DEQE	19.7%	24.3%	11.0%	25.0%
Average Knowledge of DEQE	1.36	1.34	1.62	1.34

Regional differences in level of knowledge of DEQE significant at .05

We can also expect that recognition of DEQE is not randomly distributed but rather structured along socio-economic lines and according to respondents' interests in and concern about environmental problems. Table 5.3 bears out this expectation. Using multiple regression, Table 5.3 shows the independent effects on recognition of DEQE of a selected number of respondent characteristics. Several salient findings appear in Table 5.3:

First, only location in the Central Region appreciably affects DEQE recognition, whose residents are more likely to have heard of DEQE. This may mean that the residents of this region are more likely to have dealings with the DEQE or it may reflect differences in the way that regional office operates. Of course, our data does not reveal support for either speculation.

Second, DEQE recognition depends heavily on concern with environmental problems, especially concern with state environmental problems. The more serious respondents believe state environmental problems to be, the more likely they were to hear about DEQE. In addition, the more opinions they ventured (see Chapter 3) on state environmental issues, the more likely they were to recognize DEQE. It is also interesting that respondents' views about the seriousness of their communities' environmental problems had no significant effect on DEQE recognition.

Of course, because we do not have any longitudinal information on the development of DEQE awareness, we are not able to say that believing state environmental problems are serious leads one to learn about the DEQE or the other way around. One may speculate that it is the awareness of DEQE that leads to a heightened sense of the seriousness of environmental problems. Or, alternatively, concern with state environmental problems leads to recognition of DEQE. With data obtained from a cross section in time, there is no way we can decide definitively between these alternative explanations. However, the fact that views on local environmental problems, presumably more directly experienced, do not affect DEQE recognition lends some support to the first interpretation, namely that having heard of the DEQE through the mass media gives rise to a heightened sense of the seriousness of state environmental problems.

Third, respondents who are more vulnerable to environmental problems because of their waste disposal practices are more aware of the DEQE. This finding supports an interpretation that is the opposite of the one supported in the last paragraph. In short, the presence of potential household vulnerabilities leads one to be more likely to have heard of DEQE. This finding suggests that there are mutual effects: Knowing about DEQE leads one to be more aware of state environmental problems and vulnerability to environmental problems leads one to be more aware of DEQE.

Fourth, a number of respondent personal characteristics affect DEQE awareness. As in most public policy arenas, a higher educational attainment leads to higher levels of knowledge, in this case, having heard of the agency. Women respondents are less likely to know about DEQE, although as we will see later in this chapter, women are more concerned about environmental issues. Those who are more residentially stable are also more likely to have heard of the DEQE; those who lived in their current residences for two or more years are more aware of DEQE. Also, those who are financially better off are more aware of DEQE.

All told, the findings of Table 5.3 account for a fair amount of the variation in respondents' awareness of DEQE, as shown by the R^2 value of .28. Respondents who are concerned about environmental issues are also more aware of the DEQE.

Table 5.3: Regression of Knowledge of DEQE Agency on Selected Respondent Characteristics

[Dependent Variable is Having Heard of DEQE[a]]

Independent Variables	Beta[b]
Region[c]	
Southeast	.00
West	.00
Central	.10*
Respondent and Environment[d]	
Local Environmental Seriousness	-.02
State Environmental Seriousness	.21***
Opinions on local problems	.07
Opinions on state problems	.14***
Fishes, swims	.00
Land use index	-.00
Waste disposal practices	.13**
Personal Characteristics	
Home owner	.05
Education (yrs)	.14**
Female	-.12**
2+ yrs residence	.11*
Married	.05
Age (yrs)	.02
Household income (K)	.11*
R^2 =	.28***
N=	[478]

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[a] Each respondent was given a score of 2 if he or she recognized the full name of the agency, a score of 1 if only the initials were recognized and a score of 0 if neither form of recognition.

[b] Beta coefficients with asterisks are statistically significant: "***" indicates p=.001 or less, "**", p=.01 or less, and "*" indicates p=.05 or less.

[c] Each region coded as a binary variable with values of 1 or 0. The omitted region is the Northeast/Boston Metropolitan Region.

[d] See Chapter 3 for discussion of these indices and their construction.

Awareness of DEQE Programs

In this section we go beyond name recognition to examine the extent to which respondents know about DEQE environmental programs and know that those programs are under the jurisdiction of that agency. Eleven DEQE programs are the concern of this analysis. About each of the programs, respondents were asked whether they knew of the program and, if so, did they know that the program was run by DEQE.[2]

The findings are shown in Table 5.4. In the left-hand column are the percentages of respondents who are "familiar with" each program. The middle column shows the percent of those who were familiar with the program who knew that the program was run by DEQE. The right-hand column contains the percentages of the total sample who knew the program was a DEQE one.

The eleven programs are shown in order of level of familiarity, with the most widely known program at the top and the least widely known at the bottom. Heading the list is DEQE's Vehicle Emission Inspection program, with which more than eight out of ten (84%) claim familiarity. Because nine out of ten of the respondents own automobiles subject to annual inspection, this high degree of awareness of the program is expectable. Indeed, if anything, one might have expected almost total penetration of the knowledge of this program.

Nevertheless, only a very small proportion of our respondents associated that program with DEQE, one in ten (10%) of those familiar with the program and less than one in ten (9%) of all the respondents. Clearly this is a DEQE program that is ubiquitous in its impact on Commonwealth citizenry but is not identified with the agency.

Second in achieved level of awareness is the Hazardous Waste Site Cleanup Program, familiar to slightly more than three out of five (64%) respondents. Compared to the first program, this is a program that is more frequently attributed to DEQE, being known as that agency's program by close to half (49%) of those familiar with it and close to one out of three (31%) of all respondents.

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[2] The items used in the questionnaire were designed to aid the respondent as much as possible in the recognition of these programs. The wording was; "The Department of Environmental Quality Engineering (DEQE) is involved in a wide variety of environmental programs and issues. I am going to mention a list of some programs and I would like for you to tell me if you are familiar or not familiar with these programs." A followup question was "Before this interview, were you aware that the (program) was a DEQE program?" We believe that these questions lead to some degree of over-estimation of the levels of program awareness.

The Wetlands Protection Program and the State Recycling Program are both familiar to slightly more than half of the respondents, 55% and 53% respectively. However, identification of DEQE with these programs differ: More than half (55%) of those familiar with the Wetlands program know that it is a DEQE program, but only one in five (21%) do so for the Recycling program. The consequence is that almost a third (31%) of the respondents know that the Wetlands program is a DEQE responsibility, but only one in ten (11%) know that the Recycling program is also.

The remaining seven programs are familiar to less than half of our respondents, ranging from slightly less than half (47%) for the Water Pollution Control program to less than one in ten (8%) for the Community Composting program. Correspondingly only minorities among those familiar with the programs recognize them as DEQE responsibility and even smaller percentages of the total population identify them with DEQE. The least penetration of public consciousness was achieved by the Community Composting program, known as a DEQE program to only two out of a hundred respondents (2%).

If an objective of the DEQE is to foster awareness among the Massachusetts citizenry of its programs and of the agency's responsibility for running the programs, then clearly there is a great deal of work to be done. Only the Vehicle Emissions Inspection program enjoys close to full recognition as a program. None of the programs are recognized as DEQE programs by more than one out of three respondents. The most widely recognized program is also one that is associated with DEQE by only a very small proportion (9%) of the total sample.

Table 5.4: Knowledge About DEQE Programs and of DEQE Sponsorship of those Programs

DEQE Program	Knows of Program	Knows It is DEQE[a]	Percent of Sample[b]
Vehicle Emissions Inspection	84.2	10.2	8.6
Hazardous Waste Site Clean Up	63.8	48.9	31.2
Wetlands Protection	55.2	54.7	30.2
State Recycling	52.6	21.3	11.2
Water Pollution Control	47.0	47.2	22.2
Waste Water Treatment	45.6	43.0	19.6
Solid Waste Disposal	40.6	48.8	19.8
Clean Lakes	36.6	39.3	14.4
Acid Rain Monitoring	31.6	36.7	11.6
Water Management	28.2	39.7	11.2
Community Composting	8.0	20.0	1.6

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[a] Asked only of respondents who knew about program. Percentages are based on persons who knew about program.

[b] Percent of total sample who know that the program is a DEQE program.

Determinants of DEQE Program Knowledge

Using the data displayed in Table 5.4, we can construct an index that measures how much knowledge respondents have of these programs and their sponsorship. Regional differences for this index are presented in Table 5.5.

As can be seen in Table 5.5, only very small differences can be seen between the regions in the extent to which the average DEQE program and its sponsorship are recognized. Indeed, for each region the average index score is .66 or less, indicating that few persons were even aware of a majority of the programs, and even fewer were aware of who sponsored them.

Table 5.5: Knowledge of DEQE And State Programs By DEQE Regions

	Extent of Knowing DEQE	Std. Dev	[N]
State Totals	.61	.43	[500]
DEQE REGION			
Northeast	.58	.41	[229]
Southeast	.64	.46	[103]
Central	.66	.45	[100]
West	.60	.45	[68]

Differences between regions not statistically significant.

The index of respondent knowledge of DEQE programs and sponsors can also be used in a multiple regression in which the knowledge index is the dependent variable. This analysis is presented in Table 5.6.

Clearly the largest influence on how much they know about these DEQE programs is whether or not they knew about the DEQE. At first glance this appears tautological. However, since a person can be knowledgeable about a program and not know its sponsorship, as indeed we saw was the case for the majority of the programs shown in Table 5.3, this finding is not entirely a tautology.

It should be borne in mind that many of the variables we found related to DEQE awareness shown in Table 5.3 are now subsumed in the DEQE awareness index. Thus although we find in Table 5.6 that the waste disposal practices are not related to program knowledge, we may remember from Table 5.3 that such practices enhance awareness of DEQE and hence their influence is largely absorbed in that knowledge.

Being aware enough about the state's environmental problems to have stated opinions on their seriousness is also an important determinant of knowledge about programs. In other words, those who do not care enough to have a viewpoint on environmental problems also do not care enough to learn about the programs that are run by the state.

A few additional personal characteristics of the respondents also make a difference. The better educated are more knowledgeable and home owners are more knowledgeable than renters.

The R^2 for the equation is a very respectable .34, indicating that the variables included account for more than a third of the variation in knowledgeability among the respondents.

Table 5.6: Regression of Knowledge of DEQE and State Programs on Selected Respondent Variables

[Dependent Variable is Number of State/DEQE Programs Known[a]]

Independent Variables	Beta[b]	
Region		
Southeast	.07	
West	.03	
Central	.02	
Respondent and Programs[c]		
Seriousness of State problems	.08	
Seriousness of local problems	.08	
# Opinions on state problems		.10*
# Opinions on local problems		.07
Knows of DEQE[d]	.26***	
Respondent and Environment[b]		
Fishes swims	.06	
Land use index	.04	
Waste practices	.07	
Personal Characteristics		
Home owner	.11*	
Education	.12**	
Female	.06	
2+ yrs residence	.04	
Married	.07	
Age	.06	
Household income	.05	
R^2 =	.34***	
N =	[478]	

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[a] A measure of knowledge of DEQE programs and of DEQE sponsorship. Score of 2 given for being familiar with each program and also with its DEQE sponsorship; score of 1 given for familiarity with program but not with its sponsorship; and 0 given for not being familiar with program.

[b] Asterisks indicate statistically significant coefficients. See footnote for previous regression tables for interpretation.

[c] See Chapter 3 for definitions of the first 3 variables.

[d] See Table 5.2 for definition of this variable.

Assessment of Program Performance

We now turn to assessments of the perceived efficacy of the DEQE programs. A priori there are good reasons to expect that the programs would be seen as doing good jobs. Certainly, there is sufficient concern for environmental problems and sufficient knowledge about the existence of the programs to expect that efforts to ameliorate the conditions about which people are concerned will be met with approval. However, there are also good reasons to expect that the assessments may be unfavorable. The view that environmental problems are serious may also lead people to believe that the programs are failing to achieve their objectives. In the first expectation, environmental problems are serious and the DEQE programs are good because they are attempts to address those concerns. In the second interpretation, the problems are so serious that the programs cannot efficaciously address them.

To measure popular assessments we asked our respondents to indicate whether they thought each of six DEQE programs was doing an excellent, good, fair, or poor job in dealing with the issue in question. The findings are shown in Table 5.7.

The most striking finding in Table 5.7 is that none of the six DEQE programs are seen as doing well. On the contrary, large proportions ranging from 28% to 48%, see the programs as doing poor jobs. Indeed, when the responses "poor" and "fair" are added together, the combined percentages are over 80% in five of the six programs, the exception being the Wetlands Program in which a majority of 62% see the program as poor or fair. The Water Pollution program is rated as poorest, being seen as doing only a fair or poor job by almost nine out of ten (89%) of the respondents.

Correspondingly, only very small proportions believe that any of the programs are doing an excellent job, ranging from a high of 2% believing that the Wetlands program is doing an excellent job down to 0.8% for the Acid Rain Monitoring program.

Indeed, there are very few, if any, programs of any sort that have received so poor a performance rating as the Acid Rain Monitoring program.

It is also the case that large minorities were unable to provide assessments, ranging from almost one in three for the Acid Rain program down to slightly more than one in ten (11%) for the Water Pollution program. Significant numbers of the public did not know enough about either the programs or the problems involved to form a basis for judgment.

How to interpret these findings? A potentially fruitful line of interpretation is suggested by integrating findings of Table 5.7 with those discussed in previous sections of this chapter and previous chapters. Clearly the mass media have been successful in convincing majorities of the Massachusetts citizenry that their state faces serious environmental problems at higher levels than are faced by their own local communities. At the same time, the media and other sources of information have not been as successful in producing a high level of information about the state programs aimed at addressing those problems. The consequences are such that respondents believe that those programs that do exist are ineffective.

Table 5.7: Ratings of How well the State is doing in Dealing with Six Environmental Issues: N = 500

Rating[a]	Environmental Issue [Entries are Percentages excluding "don't knows"] Acid Rain	Wetlands	Water Pollution	Air Pollution	Hazard Waste	Solid Waste
Poor	34.8	28.2	47.6	32.5	45.4	41.7
Fair	48.3	42.8	39.3	49.3	36.5	40.7
Good	16.0	27.0	11.9	17.1	16.3	16.0
Excellent	.8	2.0	1.1	1.2	1.7	1.7
Don't know[b]	28.8	19.2	11.0	16.8	16.8	16.0

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[a] Responses to item "...please indicate whether you feel the (STATE/DEQE) is doing an excellent, fair or poor job in dealing with the issue."

[b] Computed as a percentage of all respondents.

Holding Opinions on Program Performance

As mentioned earlier, significant proportions (but never a majority) were not willing (and likely were unable) to make assessments of the six DEQE programs. In Table 5.8, the average numbers of opinions held by respondents concerning DEQE programs in each of the DEQE Regions is presented. The larger the average, clearly, the more likely are residents of a region to have opinions on the DEQE programs.

As can be seen in Table 5.8, there are virtually no differences in the average number of opinions expressed on the DEQE program performance between the four DEQE Regions. Less than 1/10 of one percent separates the Northeast, Southeast and Central Regions on this index. Only for the West region does the average number of opinions held by respondents deviate from the rest, and this difference is not found to be statistically significant.

Table 5.8: Number of Opinions on DEQE Program Performance by DEQE Regions

Average Number of Opinions Held

	Number of Opinions on Program Performance	Std. Dev	[N]
State Totals	4.91	1.72	[500]
DEQE REGION			
Northeast	4.95	1.69	[229]
Southeast	4.91	1.71	[103]
Central	5.01	1.57	[100]
West	4.65	1.99	[68]

Differences between regions not statistically significant.

An analysis of opinion holding on program performance is shown in Table 5.9, using a multiple regression approach. The dependent variable in that table is the number of opinions held by each respondent. Positive coefficients for an independent variable means that persons with high scores on that variable tended to express a greater number of opinions. A large coefficient with asterisks attached marks off those variables whose effects on opinion holding are statistically significant.

The outstanding finding is that holding opinions on the performance of DEQE programs is highly related to holding opinions on the other major ratings made by the respondents. The highest coefficient in Table 5.9 is attached to holding opinions on the perceived seriousness of state environmental problems, most of which are precisely the problems to which the DEQE programs are directed. In addition holding opinions on the seriousness of local environmental problems is also related significantly to holding opinions on program performance. At the least, this finding indicates that our respondents tend to be consistent; if they do not know how serious a problem is, they do not rate how effective its corresponding program is. At the most, it indicates some support for the notion that it may be the magnitude of the environmental problems that lead to negative appraisals of the environmental programs.

There are two significant correlates of holding opinions which indicate that the salience of environmental issues is related to holding opinions on program performance. First, the more serious state environmental problems are seen to be, the more likely are respondents to hold opinions on performance. Second, those respondents who were able to identify the DEQE by name or initials are more likely to hold performance opinions.

A small number of personal characteristics are also related. Women hold fewer opinions than men. Given that women feel more strongly on the seriousness of environmental problems, this finding is somewhat puzzling. Perhaps even more puzzling is the strong negative relationship between age and opinion holding. The older a person, holding everything else constant, the less likely he or she is to hold opinions. This last finding is especially important given that this is the first equation among the several presented so far in which age plays so prominent a role. No interpretations for these two findings easily comes to mind.

The R^2 for the equation, .39, is also the largest coefficient encountered so far in this report. Its size indicates that the independent variables account for 39% of the variation among respondents in opinion holding on program performance.

Table 5.9: Regression of Knowledge Concerning State Environmental Program Performance

[Dependent Variable is Number of Environment Programs Known[a]]

Independent Variables	Beta
Region	
Southeast	-.00
West	-.05
Central	-.02
Respondent and Programs	
Local Seriousness	.04
State seriousness	.10*
Opinions state seriousness	.32***
Opinions local seriousness	.15*
Knows DEQE	.11*
Respondent and Environment	
Fishes, swims	-.01
Land use index	.03
waste practices	-.02
Personal Characteristics	
Home owner	.05
Education	.00
Female	-.12**
2+ yrs residence	-.02
Married	-.00
Age	-.20***
Household income	.04
R^2 =	.39***
N=	[454]

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[a] An index consisting of the number of opinions, scored 6 to 0, given in response to the programs listed in Table 5.5. A high score indicates that a respondent was able to rate the performance of many programs.

The Determinants of Program Performance Ratings

Although the main tendencies in the performance ratings show that the center of gravity of opinion hovers on the border between "poor" and "fair" and is decidedly disapproving of the six programs' performance, there is still some variation in those ratings. The variation is from "poor" to "good", not a wide range, but enough to sustain an analysis of what makes for more or less approval of program performance. To measure each respondent's overall program approval, an average rating was computed for each respondent.

In table 5.10, the average approval rating for each of the DEQE Regions is presented. Respondents from the Western DEQE Region show somewhat higher levels of approval of the DEQE program performance than the other regions. In addition, these differences are statistically significant. However, as can also be seen in this table, the overall rating for all of the regions is less than favorable. Indeed, the highest rating, from the West region, merely offers a "fair" rating, while the Northeast, Southeast, and Central Regions lean further toward offering an overall "poor" rating of program performance.

Table 5.10: Favorable Rating of DEQE Program Performance by DEQE Regions

	Favorability Of DEQE Programs	Std. Dev	[N]
State Totals	1.83	.55	[468]
DEQE REGION			
Northeast	1.79	.54	[214]
Southeast	1.77	.50	[97]
Central	1.86	.55	[96]
West	2.01	.64	[61]

Scale increments include: 1 (poor Job), 2 (fair), 3 (good), 4 (Excellent Job).
Differences in level of favorable rating for DEQE programs significant at .05

This average approval rating for DEQE programs was also used as the dependent variable in the multiple regression shown in Table 5.11. Table 5.11 contains several important findings:

First, the most important variable in the equation is the perceived seriousness of state environmental problems: The more serious the state's environmental problems are seen to be, the more disapproving is the average view of program performance.

Second, the more programs respondents know about, the higher the level of program performance approval.

Taken together, these two findings provide additional support for the interpretation that negative program appraisals stem from the view that the environmental problems faced by the state are very serious and from a dearth of knowledge about its existing environmental programs. Indeed, it appears that the most disapproval would come from those who care the most and know the least about what is being done.

This interpretation has important implications for DEQE policy. If the agency wants more approval of its programs, it has a clear need to make more information available on its programs, especially to those who are worried and concerned about the state's environment.

A third finding shows that respondents from the Western Region are more approving of DEQE programs. This finding may reflect better program information in that Region or greater visibility of DEQE programs in that region. Of course, the data provide no direct information on either interpretation.

The remaining variables in the equation do not produce statistically significant effects. This absence of findings, of course, does not mean that these variables are not important: Many of them work through influencing those that are. Recall that in chapter 3, we found that the seriousness of state environmental problems depended on a variety of experiences and personal characteristics -- for example, household waste disposal practices and educational attainment -- that do not figure at all in Table 5.11. This means that such variables work through their influence on the perceived seriousness of state environmental problems: Hence, when perceived seriousness is held constant, as in Table 5.11, neither educational attainment nor household waste disposal practices directly affect program performance ratings.

Table 5.11: Regression of Favorable Ratings of DEQE Environmental Programs

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[Dependent Variable is Average of Approval Scores for Six DEQE Programs]

Independent Variables	Beta
Region	
West	.14**
Southeast	-.00
Central	.05
Respondent and Programs	
Heard of Programs	.14*
Knows of DEQE	.06
State Seriousness	-.36***
Local Seriousness	-.09
Opinions on state	.09
Opinions on local	.02
Opinions on performance	-.06
Respondent and Environment	
Land use index	.02
Waste practices	-.04
Fishes, swims	-.05
Personal Characteristics	
2+ yrs residence	-.02
Female	-.05
Married	.04
Education	.03
Home owner	.08
Household income	.00
Age	.00
R^2 =	.18***
N=	[453]

Chapter 6

Popular Support for Environmental Programs

Introduction

The last two chapters have documented to the point of redundancy that the citizens of the Commonwealth regard the environmental problems faced by the state to be serious and also that the existing programs, to the extent that such programs are known, are believed to be ineffective. In short, there is a perceived gap between need and performance. In this chapter, we take the next step to determine whether the citizenry is willing to support any additional measures, or reinforcement of existing measures to order to close that gap between need and performance.

The major findings of this chapter are that large majorities want to see additional spending and additional enforcement efforts. It is unfortunate that the DEQE Household Survey did not ask respondents how willing they were to see their taxes increased to support additional environmental protection efforts and what amounts of additional taxes they were willing to pay. If we can safely infer that some additional tax burden may be acceptable, we are left in the dark about how far the citizens of the state are willing to go.

Support for Environmental Programs

A series of questions asked respondents their assessments of the effort currently made in protecting the environment. Although one of the six questions did not specify state programs, the remaining five did. Furthermore, the questions followed a series of items concerning the seriousness of state and local environmental problems and hence were set in the context of state and local arenas.

The answers to the six questions are shown in Table 6.1. Their most outstanding characteristic is solid majority support for more spending on the environmental protection programs, more state regulation, and endorsing the idea that state regulations have not gone far enough. In addition, solid majorities endorsed very high standards in such regulations and rejected the idea that environmental regulations should be abandoned when they threaten economic development and endorsed a statement that improvements should be undertaken regardless of cost.

More than four out of five (82%), stated that there was too little spending on environmental protection programs and only 4% thought that too much was spent on this issue. Seven out of ten (70%) thought there was too little state government environmental regulation, and less that one in ten (7%) believed there was too much regulation. Nearly three out of four (74%) stated that the state regulations had not gone far enough, whereas slightly more than one in twenty (6%) thought regulations had gone too far.

The majorities in favor of increased state regulation and spending are indeed impressive!

Large majorities also agreed with stands advancing the priority of environmental protection over economic development (63%), calling for higher (and presumably stricter) environmental standards (77%), and endorsing the position that environmental improvements should be made regardless of costs (68%).

Correspondingly, about one in twenty respondents believe that the Commonwealth is spending or regulating too much and one in five believe that these levels are about right.

Consistent with other topics discussed in this report, a small proportions of our respondents do not express opinions on these issues. The percentages responding "don't know" to the six items in Table 6.1 range from 7% to 15%.

Table 6.1: Support for Environmental Protection Programs

Statement	Percent Responding[a] Too Much	About Right	Too Little	Don't know[b]
Spending on environment	3.8	14.7	81.5	11.4
State government regulation	6.8	22.9	70.3	14.4
Regulations strike right balance?	5.7	20.3	74.1	15.2

Statement	Agree	Disagree	Don't know[a]
"Protecting the environment must not prevent economic development."	36.7	63.3	10.6
"Protecting the environment is so important that requirements and standards cannot be too high."	77.2	22.8	7.0
"Continuing environmental improvements must be made regardless of how much it costs".	67.8	32.2	6.8

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[a] Percentages computed excluding "don't know" responses.

[b] Computed on base of total sample, 500.

Nation-wide Public Opinion On Support for Environmental Programs

Massachusetts citizens are more supportive of environmental protective measures than the nation-wide public, as Table 6.2 shows. We have collected national survey data collected over the period 1984 to 1988 by a variety of reputable national survey organizations[1]. Panel A of Table 6.2 contains answers to questions that are almost identical to the first item reported in Table 6.1; in Panel B of Table 6.2 are reported answers to a question that asks directly whether spending for environmental protection should be increased or decreased.

Perhaps the most relevant national data are reported in the last line of Panel A of Table 6.2: In 1988, the General Social Survey found that almost two thirds (65%) of the national public believed that too little was being spent on environmental protection. The majority (65%) is appreciably smaller than the 82% shown in Table 6.1 for our comparable question, but it is still a comfortable majority. Our Massachusetts respondents are more supportive of expenditures for environmental protection than the average American citizen.

Note that this national majority stating that environmental protection spending is too little is very robust; it persists at the same magnitude from 1984 to 1988[2], is found by all of the survey organizations, and is not sensitive to changes in the wording of the questions involved. The proportion saying that too little is being spend has a low of 54%, as reported by the Roper Organization in 1984, and reaches 65% in 1988 in the General Social Survey. When the question is worded to call for endorsements of increases or decreases in spending on environmental protection programs, as shown in Panel B of Table 6.2, the majorities in favor of increases are of the same magnitude. The Opinion Research Corporation in 1985 and Yankelovitch, Skelly and White in 1988 both report the lowest percentages endorsing increases, 56%. In 1988, the high, 60%, was reported by the General Social Survey.

There is one respect in which there is a sizable difference between the findings from recent national surveys and the DEQE Household Survey. Our respondents register about two to three times the level of "don't knows" recorded for the national samples. In the national surveys the percentages range from 1% to 8% whereas the Commonwealth citizens register 7% to 15%. We believe these differences reflect the fact that our survey was almost entirely about environmental issues whereas in the national surveys these questions are embedded in the context of a wide variety of issues. Many of the questions we used asked about how much information respondents had on the issues as well. In addition, typical national survey organizations urge interviewers to discourage "don't know" responses whereas our survey practices do not challenge respondents to take a stand when they appear to be undecided.

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[1] As in the case of previous national survey data cited in Chapter 4, these data were obtained from the Roper Public Opinion Library of the University oif Connecticut.

[2] National survey data from the period before 1984 indicate that this majority has grown slightly from about the middle of the 1970s. In short, there has been fairly strong support for environmental protection measures for at least two decades.

The DEQE Household Survey did not ask respondents how willing they were to follow up on their support for increased spending and regulation by paying additional taxes. The questions we posed to them are silent on how the increases are to be supported fiscally. However, we can infer that they would be willing to pay more taxes from the responses given in national surveys in which the tax implications were questioned directly. There are numerous indications that people are willing to foot some of the costs of improvements in the environment. Several examples follow: In 1984, an AP/Media General study found that when asked "If making improvements in our environment cost you (the respondent) 10 percent more in taxes and cost of living, would you favor making environmental improvements," two out of three (65%) were willing to do so. (Note that this about the same proportion who wanted to see increases in the support of such programs, as shown in Table 6.2.) Only 26 percent stated they would not be in favor of such tax increases (9 percent did not know). In 1985, when asked by the same survey organization if they would be "willing to pay higher state and local taxes to clean up toxic wastes in your area," about the same sized majority (64%) replied that they would be willing. In a 1986 Market Opinion Research study, when asked to agree or disagree with the statement "I am willing to pay taxes which are dedicated to preserve natural areas in this country," only 7 percent registered disagreement while approximately 87 percent agreed.

In 1988, a CBS News/NY Times poll found that, when asked " would you be willing to pay higher taxes of $100 per year for each of the next 10 years in order to clean up the toxic and hazardous waste problem in America," a two thirds majority (65%) stated that they would be willing to pay the additional taxes. More recently, in 1989, a Marist Institute study found that, when asking the more generic "would you be willing to pay higher taxes for improving the quality of the environment?", 66 percent of the respondents stated they would be willing.

This is not to say that one can make the blanket statement that the majority are willing to pay additional taxes regardless of the situation. Indeed, in a 1985 Yankelovich, et al. study where respondents were asked "in order to do more to clean up toxic wastes, would you be willing to pay higher federal income taxes to fund cleanup programs across the nation," 47 percent of the respondents replied negatively, while only 49 percent stated that they would be willing to pay increased income taxes. Here, it appears that the "across the nation" may have been less acceptable than programs designed specifically for the respondents' home areas. In that same study, 52 percent of the respondents stated that they were not willing to pay higher insurance premiums to protect their "health and property" in order to do more to clean up toxic wastes.

Similarly, the results from the various surveys are not always consistent when examining the willingness of respondents to accept consumer price increases. For example, in a 1985 Yankelovich et. al. study (of registered voters), respondents overwhelmingly favored a proposal "imposing high taxes on companies which pollute the environment, even if these companies' products would be higher priced because of the tax law," with 79 percent being favorable and 16 percent opposed to such price increases. And, in that same study, respondents also overwhelmingly favored proposals requiring "more effective pollution control equipment in electric power plants" even if rates were to go up (71 percent favorable to 23 percent opposed; and a proposal "strictly enforcing pollution regulations against an industrial plant in your area, even if workers might be laid off as a result," (73 percent to 17 percent). From these findings, it would appear that persons were willing to accept the financial burden.

Yet, in this same study, a majority of respondents were opposed to a proposal to prohibit off shore drilling for oil "if this (proposal) were to cause higher gasoline prices," (53 percent opposed, 38 percent in favor and 10 percent registered "don't know"). In addition, the extent to which respondents are willing to accept higher consumer prices is less clear when examining the findings from other studies. In a 1984 Opinion Research study, respondents were split on paying higher electricity bills in order to combat acid rain. When asked if they would favor restrictions on the use of coal in electric power plants "if those restrictions would mean the electricity would cost more," 41 percent of the respondents opposed such restrictions, while only

47 percent responded favorably. An additional 12 percent did not know. Similarly, a 1988 study by CBS News and the New York Times found that 58 percent of the respondents were not willing to accept a $50 per month increase in their electric bills if that increase was necessary to reduce the pollution which is believed to be causing the "green house effect." In this study, only 37 percent of the respondents were willing to accept the additional utility charge, while 5 percent were unsure how they stood in the proposal.

Overall the findings of the national opinion surveys of the past five years indicate that a solid majority of Americans are willing to pay increased taxes for increases in the strictness of environmental programs, in their scope and intensity. Whether or not they are willing to pay higher prices for all products that might result from such regulation is not as clear.

Table 6.2: National Survey Data on Environment Protection Support: 1984-1988.

A. Assessment of Spending on Environment Protection

Date and Source[a]	Too Little	About Right	Too Much	Don't know
1984 GSS	59%	33%	4%	4%
1984 Roper	54%	34%	6%	6%
1984 Kane	57%	30%	8%	5%
1985 GSS	60%	27%	7%	6%
1985 Roper	56%	28%	8%	7%
1986 GSS	59%	29%	5%	6%
1986 Kane	54%	32%	6%	8%
1986 Roper	59%	27%	6%	8%
1987 GSS	65%	25%	5%	5%
1988 GSS	65%	26%	5%	4%

B. Government Spending on Environmental Protection Increased or Decreased

Year and Source[a]		Increase	Same	Decrease	Don't know
1985	ORC	56%	35%	8%	1%
1987	Gallup	59%	34%	4%	3%
	GSSa	60%	28%	7%	5%
1988	Yank	56%	34%	9%	2%
	CBS/NYT	59%	34%	3%	4%

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[a] GSS - General Social Survey, an annual national survey run by the National Opinion Research Center at the University of Chicago and funded by the National Science Foundation.
Roper - The Roper Organization, a national survey organization.
Kane - Kane, Parsons, Inc.
Yank - Yankelovitch, Skelly and White, Inc.
CBS/NYT - CBS/New York Times poll.
ORC - Opinion Research Corporation.
Gallup - The Gallup Organization

Holding Opinions on Support for Environmental Programs

Although almost every respondent gave at least one answer to the six questions on support for environmental programs, there was sufficient variation in the numbers of opinions offered to sustain an analysis of opinion holding on these issues. Respondents were given a score ranging from 6 down to 0 representing the number of support questions to which they gave opinion responses, a measure of the strength of opinions held by the respondents.

In Table 6.3, the average number of opinions expressed by respondents from each of the DEQE Regions is presented. Only small, and not statistically significant, differences among respondents from different regions in the numbers of opinions held on environmental program support. Indeed, only the highest and lowest scores (the Southeast and the Central regions, respectively) on this scale were only separated by .15. The Northeast and the West regions were equal. As can be seen in this table, what variation that does exist with regard to holding opinions about environmental programs can not be explained by examining only the region in which the respondent resides.

Table 6.3: Holding of Opinions on Environmental Program Support: DEQE Regions

	Average Number of Opinions on Env. Programs	Std. Dev	[N]
State Totals	5.35	1.25	[500]
DEQE REGION			
Northeast	5.35	1.23	[229]
Southeast	5.27	1.28	[103]
Central	5.42	1.35	[100]
West	5.34	1.13	[68]

Differences between regions not statistically significant.

Using the number of opinions held as the dependent variable, multiple regression analysis was used to produce the findings shown in Table 6.4.

There are several striking features of the analysis reported in Table 6.4: First, opinion holding on support for environmental programs is highly structured, as the very high R^2 value, .44, indicates. This high value means that the independent variables included in the equation account for almost half, 44%, of the variation among respondents in opinion holding. (It should be noted that this value is the highest among all the multiple regressions shown in this report.)

Second, the factor that is most strongly related to holding opinions on program support is holding opinions on program performance. That is, if respondents had made up their minds about how the state environmental programs were performing they were also willing to state their opinions concerning increasing or decreasing support for those programs. This means that respondents were willing to provide increased support for programs that they also regarded as ineffective. This finding also has the implication that the programs are seen as ineffective because the current level of effort and fiscal support is insufficient.

Third, holding opinions on support issues are related to holding opinions on related issues such as being aware of the state programs that are in place, believing that state environmental problems are serious, and holding opinions on the seriousness of local environmental problems. In short, people who know about what is being attempted, who think the problems addressed are weighty and who are aware of local environmental conditions are more likely to have views on whether state programs should receive additional support.

Finally, there are two personal characteristics that are related to holding opinions: Higher income respondents hold fewer opinions and older respondents hold fewer opinions. Without further information, any interpretation of these findings is clearly speculative. All along, we have seen that older respondents were less aware of environmental problems, less knowledgeable and less worried about those problems. However, awareness and concern are held constant in the equation; hence, the effect of age shown is over and above awareness and concern. Much the same problems plague the interpretation of the income effects since the effects of income are also incorporated into many of the other variables in the equation. Because direct effects of both income and age show up strongly in this context and not at all in previous chapters, it is clear that such effects are specific to the topic. This suggests that higher income and older persons are specially sensitive to the implications of such increases, perhaps for prices and taxes, are caught in the cross pressures between increased costs and their interest in increased environmental protection, expressing the resulting ambivalence in "don't know" responses.

Table 6.4: Regression on Environmental Program Support Opinion Holding

[Dependent Variable is Number of Opinions Held on Support]

Independent Variable	Beta
Region	
West	.02
Central	-.00
Southeast	-.03
Respondent and Programs	
Knows about State programs	.09*
SUpport for state programs	.03
Aware of DEQE	.03
State program performance	-.00
Opinions on program performance	.42***
Local seriousness	.00
State seriousness	.09*
Opinions on local problems	.08*
Opinions on state problems	.07
Respondent and Environment	
Land use index	.01
Waste Disposal practices	-.02
Swims, fishes	.04
Personal Characteristics	
2+ yrs residence	.01
Female	-.02
Education	.06
Married	.02
Homeowner	.03
Income	-.13**
Age	-.13**
R^2 =	.44***
N=	[453]

Who Supports Increases in the State Environmental Effort?

Using the answers to the six questions we can compute an index of how supportive respondents are of the state's environmental programs. The index formed is an average of those responses - the higher the average score the more a respondent endorses increases in the support for such programs and in their strictness. In Table 6.5, the average level of support for environmental programs is presented for each of the DEQE Regions.

As can be seen in Table 6.5, once again we find no statistically significant differences between respondents from the various DEQE Regions. Respondents from each region show relatively high levels of support for environmental programs, with only slight variation between regions. Indeed, high levels of support for environmental protection programs are state-wide.

Table 6.5: Average Level of Support for Environmental Program by DEQE Regions

	Level of Support For Env. Programs	Std. Dev	[N]
State Totals	2.53	.48	[500]
DEQE REGION			
Northeast	2.53	.50	[227]
Southeast	2.60	.43	[101]
Central	2.50	.45	[96]
West	2.46	.53	[68]

Scale ranges from 1 to 3 from lowest to highest level of support.
Differences between regions not statistically significant.

The results of a multiple regression analysis using the average level of support as the dependent variable are shown in Table 6.6.

The clearest and strongest findings in Table 6.6 are that the more serious local and state environmental problems are seen to be, the stronger the support for corresponding programs. These findings provide additional support for the main interpretative theme advanced in this report: Massachusetts citizens believe the state's environmental problems are serious and for that reason endorse efforts to bolster the state's weak protective programs with increased funds and higher environmental standards.

In addition, those who use the environment for recreational purposes -- for swimming and or fishing -- are also more supportive of increases in state environmental programs. It is important that this finding surfaces at this point. In earlier chapters, we have seen that recreational environmental use increases one's perceived seriousness of environmental problems and the effects of such usage in most analyses are absorbed into those of seriousness. In Table 6.6, recreational environmental usage has a direct effect on support over and above perceived seriousness: Those who swim or fish are especially concerned to see reinforced environmental programs.

Similar findings emerge with respect to sex of the respondent. Women are more supportive than men, over and above the effects of the other variables in the equation. The direct sex effect is quite strong indicating that women feel particularly strongly that state efforts to protect the environment need to be strengthened, possibly reflecting the generally stronger beliefs of women about protecting the quality of life for future generations.

All told, these factors account for a fairly large proportion of the variation in support for environmental programs. The R^2 value of .25 is especially large considering that there is not much variation in such support, as indicated by the heavy majorities expressing strong support for environmental programs.

Table 6.6: Regression of Support for Environmental Programs

[Dependent Variable is Support for Environmental Programs]

Independent Variables	Beta
Region	
West	-.06
Southeast	.05
Central	-.03
Respondent and Programs	
State Program knowledge	-.01
Performance of State programs	.01
Heard of DEQE	-.08
Opinions on support	.05
Holds opinions on performance	-.01
State seriousness	.29***
Local seriousness	.15**
Opinions on state seriousness	-.12*
Opinions on local seriousness	-.02
Respondent and environment	
Land use index	-.02
Waste disposal practices	.06
Swims, fishes	.15**
Personal Characteristics	
2+ yrs residence	.02
Female	.17***
Education	-.09
Married	-.11*
Home owners	-.08
Age	-.06
Income	.00
R^2 =	.25***
N =	[453]

Periodic Indicator Studies.

One shot cross sectional surveys like the one discussed in this report are quite useful for assessing the particular positions and opinions held by the public at a given point in time. Information gained can be used for short term planning, as well as directing outreach programs aimed at further educating one's constituencies about the services offered by an agency. However, cross sectional surveys are silent on the issue of trends: We cannot tell from the DEQE Household Survey whether there have been improvements in the content of public opinion or whether it has been changing in undesirable directions.

Very strong arguments can be made for establishing an indicator time series based on periodic surveys that can monitor trends in household behavior and opinion. When fully established this research program can provide continuous feed-back to DEQE concerning the success of its policies.

The most straightforward recommendation for future research, therefore, is for periodic follow-up studies aimed at assessing the time trends in public opinion on the issues addressed in this study.

We recommend periodic studies spaced two to three years apart.

These periodic studies could chart changes in public perceptions of environmental problems, and provide first indications concerning how effective are the state's efforts to raise public consciousness and knowledge concerning the environment. In addition, the periodic studies would also provide an assessment of DEQE outreach efforts by measuring the extent to which there is exposure to those programs and resulting increased public awareness and support of the various DEQE programs.

Periodic trend studies require careful planning. Clearly only those trends can be plotted which are measured consistently and with precision on each and every periodic study. We recommend that at least one year of intensive planning be devoted to deciding what should be measured and for the development of precise measures. The planning period would also cover

Chapter 7

Suggestions for Future Research

No single research effort ever settles all issues for all time. On the contrary, most raise as many or even more issues than they settle. This is especially the case for research forays into areas that have not been extensively investigated previously. It is therefore scarcely surprising that the DEQE Household Survey, being the first of its kind in the Bay State, tells us as much about what we do not know as much as it has reduced our lack of knowledge concerning public opinion and environmental issues in this state.

Although the DEQE Household Survey has yielded important information about the concerns of the Massachusetts public, and about the degree of support for environmental protection programs, the study has also revealed important and intriguing gaps in our knowledge. We can now be certain that the citizens of the Commonwealth take environmental issues seriously, worry about environmental problems and are willing to see resources allocated to their successful solution. Our findings also present several intriguing mysteries. For example, it is abundantly clear that our respondents did not think that current programs are effective, but that data do not reveal whether that opinion is based on assessments of the programs or of the gap between the effort needed and the effort expended. We also learn that the respondents are seemingly very generous in expressing their convictions that more resources ought to be put into environmental programs. Of course, it is easy to express an interest in a Ferrari, but that interest can be easily checked by knowledge about the price tag attached. We need to know how much additional money will taxpayers be willing to pay in order to have the environmental programs properly supported. In short, it is easy to be generous when the cost of generosity is not specified.

The point of the last few paragraphs is that there is much research yet to be undertaken. In the remainder of this chapter, we outline a program of research on Bay State public opinion for DEQE's consideration. This suggested program is generated partly by the findings of the DEQE Household Survey and partly by more general considerations concerning public opinion.

environmental problems. One potentially useful focus for future studies is that of the perceived impacts of those problems on the respondent. For example, how concerned are the citizens of the commonwealth with the pollution of lakes streams and shore lines? Are respondents concerned about eating shellfish taken from Massachusetts shores? How poor, or good is the quality of water in the state, and do respondents have concerns about water supplies? Are respondents concerned about the world in which their children will grow up in?

Impact studies such as this could be done in conjunction with other follow-up studies or separately. Information obtained from this type of study would be very useful for developing additional outreach programs, as well as for developing strategies for dealing with public concerns.

Program Effort.

Several items in the survey discussed in this report assessed the extent to which respondents supported current DEQE program efforts. Although the overall opinion of the quality of work those programs have done was somewhat low, there was overwhelming support for stronger environmental controls and cleanup. One area which would be very useful to explore in depth in future studies, therefore, would be to assess the extent to which the public perceptions of program quality are affected by the constraints felt by those programs. Are these DEQE programs doing as well as they can, considering the fiscal and manpower constraints felt by the DEQE?

Priority Studies.

Throughout the review of previously conducted national studies, we found that a large majority of the population of the U.S support increased spending on environmental protection and cleanup. In addition, most polls indicate that the public is willing to pay for such protection and cleanup with higher taxes. Although the survey instrument used in this project did not directly ask respondents about their willingness to pay increased taxes in order to finance environmental efforts, a vast majority of Massachusetts residents believe that too little is being spent on protecting the environment, and are willing to clean up the environment "regardless of how much it costs!"

extensive testing of the instruments developed.

Special Studies

There are many issues that require special in-depth studies. Listed below are some examples, most sparked by findings related in previous chapters of this report.

Vulnerability

Throughout the chapters of this report, an almost consistent finding is that citizens who are exposed to the environment either 1) through its use -- swimming or fishing; 2) through producing hazardous wastes; or 3) being especially dependent on their own actions vis a vis the environment, as for example, in being dependent on a domestic well for water. These findings suggest that there is an important direct connection between personal direct experiences and heightened consciousness.

This finding was not anticipated in advance. Hence the questions included in the study were limited in both number and scope. For example, most of the vulnerability measures concern the household either in its domestic activities or in outdoor recreation. Nothing was included in the study concerning exposure to occupational hazards or to food additives. Especially important is the issue of occupational hazards, work activities that either expose the worker to environmental hazards or consist of activities that increase the exposure of the environment to risks.

We recommend the planning and carrying out of a focused study of the connections between individual and household activities in work, domesticity and in play and individual environmental concerns. We believe that the findings of such a study would provide important clues about how better to motivate individual citizens to adopt appropriate behavior as well as to support appropriate public policies.

Perceived Impact

In this study, several items addressed the respondent perceptions about local

A major recommendation for future research, therefore, would be to assess to what extent Massachusetts residents ARE willing to pay for increased environmental protection programs. In addition, it would be important to asses what tradeoffs in public services the citizens of Massachusetts would be willing to accept for such increased efforts, given the fiscal difficulties facing the Commonwealth at this time.

These recommendations for future studies represent, we believe, viable and useful additions to the project discussed here. Although each of these studies would require additional funds, and would take a longer period of time to implement, the information gained would serve to guide the DEQE in future outreach and educational endeavors. Similar cooperative efforts between SADRI, The Environmental Institute, and the DEQE Office of Research and Standards, would allow for an increased understanding of the publics concerns and desires with regard to the environment, and allow for useful and directed efforts on the part of the DEQE.

Appendix A

Survey Questionnaire and Overall Findings

This appendix contains a "copy" of the survey instrument used in the DEQE Household Survey. Because the actual instrument used consists of a computer program that displayed each question on a screen for an interviewer to read over the telephone, no hard copy questionnaire was actually used. The instrument shown below is a hard copy equivalent showing the exact wordings of questions as they were flashed on the screen. The overall distribution of responses to each question is shown in percentages.

INTERVIEWER: Hello, my name is ___________, and I am with Market Street Research. We are conducting a survey for the Social and Demographic Research Institute at the University of Massachusetts. The purpose of this survey is to find out about your concerns with the environment and what is being done to protect the states' natural resources.

[The section which follows screens the household for eligibility and to select an appropriate respondent.]

1. To be sure I've reached the right number, is this [VERIFY TELEPHONE NUMBER]?

[IF YES: PROCEED]

2. [IF NO: I must have dialed the wrong number. Sorry to have bothered you. HANG UP AND RE-DIAL]

3. To determine who in your household I should speak with, could you tell me how many adults (18 years and older) are in your household? [ENTER NUMBER]

    [IF QUESTIONS OR REFUSES NEED FOR INFORMATION: I can understand why you might hesitate to give me that information. We use a computer to randomly decide who to contact in the household. It chooses the person based on the total number of adults and the number of males and females in your household. REPEAT & ENTER NUMBER. IF STILL REFUSES, ENTER AS REFUSAL, CALLBACK IN ONE DAY & TRY AGAIN].

4. And of those adults, how many are male? [ENTER NUMBER: IF REFUSES USE EXPLANATION & PROCEDURE OUTLINED ABOVE].

5. For the purposes of the survey, I need to speak with the __________ in your household. [COMPUTER DISPLAYS SPECIFIC HOUSEHOLD MEMBER, SUCH AS FEMALE, OLDEST ADULT MALE, YOUNGEST ADULT FEMALE, ETC. COMPUTER USES AN ALGORITHM THAT TAKES INTO ACCOUNT HOUSEHOLD SIZE AND SEX COMPOSITION[1] TO DETERMINE RANDOMLY WHO IS TO BE INTERVIEWED. INTERVIEWERS ARE MONITORED ON-LINE TO INSURE THAT THEY CONTACT THE RIGHT INDIVIDUAL AND ENTER THE HOUSEHOLD DATA ACCURATELY].

6. Is that person available?

> [IF YES:] Can I speak with _______ please? [IF NOT AVAILABLE, SET UP CALLBACK TIME & ENTER NAME. IF AVAILABLE, PROCEED WITH INTERVIEW].
>
> IF PERSON ANSWERING THE PHONE AND/OR THE RESPONDENT APPEARS HESITANT TO PROCEED WITH THE INTERVIEW OR REFUSES, THE INTERVIEWER IS INSTRUCTED TO URGE COOPERATION[2].

---

[1] This is a variation of the Carter-Trojdahl-Bryant method of respondent selection, a procedure that compensates for the varying sizes of households.

[2] The interviewers are trained to field questions about why we need to know certain information and are given procedures for dealing with situations where information is refused. If something unexpected comes up, the interviewers are trained to ask their supervisors to handle the problem. Answers used by interviewers fielding the DEQE survey to questions frequently raised by respondents are as follows:

- WHO IS THE SURVEY BEING CONDUCTED FOR? The survey is being conducted for the Social and Demographic Research Institute at the University of Massachusetts.

- WHAT IS THE PURPOSE OF THE SURVEY? The purpose of the survey is to help state agencies dealing with environmental issues to determine whether people are aware of the state's programs, and to see what people in your community think about various environmental problems.

- WHERE DID YOU GET MY TELEPHONE NUMBER/MY NUMBER IS UNLISTED. Your telephone number was generated randomly using a random digit dialing technique. We know what all the local exchanges are, and we generate a list of telephone numbers randomly using a computer. We don't know your name or address.

- HOW LONG DOES THE SURVEY TAKE/I DON'T HAVE MUCH TIME. The survey only takes about 15 minutes to complete.

- I DON'T LIKE DOING SURVEYS/I'M NOT INTERESTED THANK YOU. I can appreciate your feelings about surveys, but we really need the opinions of a wide range of people so our results will be representative of Massachusetts. OR: Your opinions could have an impact on the way environmental issues are handled in the state. This is a good way for you to let the state know what you think. OR: The survey doesn't take long, and it is very important I speak with you. OR: you'd really be helping me out tonight if you'd take a few minutes to do the survey. I'm very interested in your opinions and our survey would be that much better if you participated. Interviewers use a variety of ethical techniques to thwart refusals.

- ARE THE RESULTS CONFIDENTIAL/I'M AFRAID YOU'LL TELL PEOPLE ABOUT MY HOUSEHOLD. I can assure you that your answers are kept strictly confidential. After we're done with the survey, your telephone number is removed from the questionnaire and your answers are grouped with those of hundreds of other people, with no way of telling who gave what response. In fact, I don't even know your name, because we generate the telephone numbers randomly using a computer.

[Main portion of the interview.]

7. First, How long have you lived at your current address	N=498
1 year or less	15.7
2 years	12.4
3 years	8.2
4 years	5.8
5 years	7.4
6 years	4.4
7 years	1.8
8 years	3.0
9 years	1.4
10 or more years	39.8

8. Currently Lives In:	N=500
House you own	58.8
Condominium you own	3.4
Duplex	2.8
Trailer	0.8
House you rent	10.4
Apartment in building with 20 or fewer apartments	15.0
Apartment in complex with 20 or more apartments	8.8

9. Water Service Used	N=500
Well water	15.8
City or town water	82.6
Don't know	1.6

- I DON'T WANT TO TELL YOU MY AGE/INCOME/OTHER PERSONAL INFORMATION. I can understand your hesitation. These questions are only asked so we can make sure our sample is representative of Massachusetts residents. The questions are the same as those asked on the State Census, and we use the results to compare the opinions of different groups of people.

- I'M TOO OLD/SICK/MY OPINION DOESN'T MATTER/I DON'T KNOW ENOUGH. Actually, you are exactly the kind of person we want to talk to, because otherwise our survey won't be representative of Massachusetts residents. The questions are not at all hard-why don't I try a few and you can see how the survey works

- I DON'T WANT TO BUY WHATEVER YOU ARE SELLING/DEAR ABBY SAYS NOT TO AGREE To SURVEYS. I can assure you that we are not selling anything at all. We're working with a state organization and my only purpose in calling you is to ask you questions as part of a survey. You won't be contacted again after we complete the interview.

10. On a scale from 1 to 10, with 10 being the best quality and 1 being the worst quality, how would you rate the quality of your drinking water?

	N=500
1 Worst quality	10.0
2	2.8
3	5.2
4	4.0
5	11.8
6	7.2
7	10.6
8	19.8
9	8.6
10 Best quality	14.4
11 Don't know	5.6

11. What type of sewage disposal system do you have?

	N=500
Town or city sewage system	60.2
Septic tank or field bed system	36.2
Don't know	3.6

12. How often do you clean your septic tank?	N=181
More than once a year	5.5
Once a year	21.5
Once every two years	21.0
Once every three or more years	31.5
Never	10.5
Don't know	9.9

13. How do you disposes of your household trash?	N=500
Town-city trash collection	64.6
Private trash collection	18.4
Take to town-regional landfill facility	14.6
Other	0.6
Don't know	1.8

14. Are there any factories within 1/2 mile of your residence?	N=500
Yes	28.2
No	70.0
Don't know	1.8

15. Have these factories caused problems for you?	N=141
Yes	9.9
No	87.9
Don't know	2.1

16. Are there any gas stations or auto repair shops within 1/2 mile of your residence?

	N=500
Yes	58.0
No	41.4
Don't know	0.6
	Total

17. Have these gas station(s) or auto repair shops caused problems for you?

	N=289
Yes	1.4
No	97.9
Don't know	0.7

18. Is there a landfill within 1/2 mile of your residence?

	N=500
Yes	7.8
No	87.8
Don't know	4.4

19. Has the landfill caused any problems for you	N=39
Yes	12.8
No	87.2
Don't know	0.0

20. Is there a sewer treatment plant within 1/2 mile of your residence?

	N=500
Yes	5.8
No	91.6
Don't know	2.6

21. Has the sewer treatment plant caused any problems for you?	N=29
Yes	13.8
No	86.2
Don't know	0.0

22. How many automobiles are there in your household?	N=500
None	7.4
One	29.6
Two	41.0
Three	14.6
Four	3.4
Five or more	4.0

23. Do you use an automobile to travel top work or school?	N=463
Yes	72.8
No	27.2
Don't know	0.0

24. In general, how often do you carry more than one person in your automobile?

	N=462
Never	11.5
Sometimes	47.4
Often	17.7
Very often	23.2
Don't know	0.2
	Total

25. Do you, or does someone in your household change your automobile oil, or do you have automobile oil changed by someone else?

	N=463
Change own oil	30.9
Someone else changes oil	67.8
Don't know	1.3

26. How do you dispose of this automobile oil?

	N=148
Disposed of with household trash	15.5
Disposed of or stored on own property	8.1
Pours down storm drain or sewer system	0.7
Return to retail outlet where purchased	25.7
Take to town hazardous waste collection center	26.4
Other means of disposal	8.1
Don't know	15.5

27. Over the past year, have you had to dispose of scrap wood and other building materials from your home?

	N=498
Yes	30.7
No	68.9
Don't know	0.4

28. How did you dispose of these building materials?

	N=155
Disposed of with other household trash	34.8
Discarded materials on own property	3.2
Burned materials on own property	12.3
Took materials to town-regional landfill	29.7
Had scrap materials taken away by someone else	14.8
Other means of disposal	3.2
Don't know	1.9

29. How about paints and oils? Over the past year, have you had to dispose of household paints, thinners, or oils?

	N=500
Yes	19.0
No	80.4
Don't know	0.6

30. How did you dispose of these paints, thinners or oils?

	N=98
Disposed of paints with other household trash	36.7
Disposed of or stored on your own property	7.1
Disposed of by pouring down storm	2.0
Take to town hazardous waste collection center	41.8
Other means of disposal	8.2
Don't know	4.1

INTERVIEWER: How frequently do you take part in each of the following activities when they are in season?

31. On average, how often do you go fishing in public lakes, ponds, streams or coast?

	N=500
Once a week or more	8.2
Several times per month	5.4
Once or twice a month	5.0
Only once or twice a year	12.8
Never go fishing	68.2
Don't know	0.4

32. How often do you go swimming in public lakes, ponds, streams or coast?

	N=500
Once a week or more	28.2
Several times per month	12.2
Once or twice a month	12.2
Only once or twice a year	13.8
Never go swimming or water skiing	33.4
Don't know	0.2

INTERVIEWER: Protection of the environment has been a major topic in the news over the past few years. I am going to mention several environmental issues and have you rate the seriousness of each issue.

33. In your City-Town, do you feel that pollution of lakes, streams or coastlines is:

	N=500
A very serious problem	30.8
Somewhat serious	33.4
Not very serious	19.2
Not a problem at all	11.6
No streams or lakes are in this town	1.2
Don't know	3.8

34. How about for the State as a whole?

	N=500
A very serious problem	58.4
Somewhat serious	28.6
Not very serious	3.6
Not a problem at all	2.8
Don't know	6.6

35. In your city-town, do you feel that the damage caused by acid rain is:

	N=500
A very serious problem	20.4
Somewhat serious	28.0
Not very serious	17.0
Not a problem at all	10.8
Don't know	23.8

36. How about for the state as a whole?

	N=500
A very serious problem	32.8
Somewhat serious	33.6
Not very serious	6.2
Not a problem at all	3.8
Don't know	23.6

37. Next, would you say that air pollution in your city-town is:

	Total
	N=500
A very serious problem	14.2
Somewhat serious	24.2
Not very serious	36.0
Not a problem at all	21.8
Don't know	3.8

38. How about for the State as a whole?

	N=500
A very serious problem	33.2
Somewhat serious	40.6
Not very serious	12.6
Not a problem at all	3.8
Don't know	9.8

39. Would you say that Solid Waste Disposal in your city-town is:

	N=500
A very serious problem	26.4
Somewhat serious	24.2
Not very serious	17.2
Not a problem at all	17.4
Don't know	14.8

40. How about for the state as a whole?

	N=500
A very serious problem	47.4
Somewhat serious	27.2
Not very serious	5.4
Not a problem at all	3.0
Don't know	17.0

41. Of the following areas, which would you say is the most pressing environmental problem facing your city-town Is:

	N=499
Air pollution	7.4
Pollution of lakes, streams and coastal waterways	15.4
Solid waste disposal	21.6
Disposal of hazardous wastes	10.8
Protection of the state's wetlands	10.0
Drinking water quality and supply	24.0
Other environmental problem is most pressing	0.8
Don't know	9.8

42. How about for the state as a whole?

	N=500
Air pollution	9.8
Pollution of lakes, streams and coastal waterways	20.0
Solid waste disposal	18.2
Disposal of hazardous wastes	17.8
Protection of the state's wetlands	4.8
Drinking water quality and supply	15.2
Other environmental problem is most pressing	0.4
Don't know	13.8

43. In general, do you feel that we spend too much on protecting the environment, about the right amount, or are we spending too little on environmental protection?

	N=500
Too much	3.4
About right	13.0
Too little	72.2
Don't know	11.4

44. In general, do you feel there is too much, too little, or about the right amount of state government regulation in the area of environmental protection?

	N=500
Too much	5.8
About right	19.6
Too little	60.2
Don't know	14.4

45. At the present time, do you think that the impact of state environmental laws and regulations have gone too far, have not gone far enough, or have the state laws struck the right balance?

	N=500
Too far	4.8
Struck the right balance	17.2
Not gone far enough	62.8
Don't know	15.2

INTERVIEW: I am going to read a few statements that have been used to characterize environmental protection efforts. For each of the statements, please state whether you agree or disagree with the statement.

46. Would you agree or disagree with the statement: "Protecting the environment must not prevent economic development?

	N=500
Agree	32.8
Disagree	56.6
Don't know	10.6

47. "Protecting the environment i so important that requirements and standards can not be too high?

	N=500
Agree	71.8
Disagree	21.2
Don't know	7.0

48. "Continuing environmental improvements must be made regardless of how much it costs."

	N=500
Agree	63.2
Disagree	30.0
Don't know	6.8

49. Have you ever heard of the Massachusetts Department of Environmental Quality Engineering?

	N=500
Yes	60.0
No	40.0

50. Sometimes the agency is talked about as the D E Q E - Have you ever heard of the DEQE?

	N=200
Yes	51.0
No	49.0

51. How did you first hear about The DEQE?	N=402
Television, newspaper or radio news item	45.3
Advertisement in the media	0.7
Word of mouth	12.7
Saw signs by buildings or on side of road	17.9
Personal experience	19.9
Other	1.0
Don't know	2.5

52. What happened to initiate your personal experience with the DEQE?

	N=80
Educational or public forum	16.3
General business with the DEQE	61.3
Complaint initiated by respondent	3.8
Complaint initiated against respondent	1.3
Other	16.3
Don't know	1.3

INTERVIEWER: I am going to mention several environmental issues in Massachusetts. For each of these issues, please indicate whether you feel the (STATE/DEQE) is doing an excellent, good, fair, or poor job in dealing with these issues.

53. Dealing with acid rain, would you say that the (State/DEQE) is doing an:

	N=500
Excellent job	0.6
Good	11.4
Fair	34.4
Poor	24.8
Don't know	28.8

54. How about Protection of Wetlands	N=500
Excellent job	1.6
Good	21.8
Fair	34.6
Poor	22.8
Don't know	19.2

55. How about Water Pollution	N=500
Excellent job	1.0
Good	10.6
Fair	35.0
Poor	42.4
Don't know	11.0

56. How about Air Pollution	N=500
Excellent job	1.0
Good	14.2
Fair	41.0
Poor	27.0
Don't know	16.8

57. How about Hazardous Waste	N=500
Excellent job	1.4
Good	13.6
Fair	30.4
Poor	37.8
Don't know	16.8

59. How about Solid Waste Disposal	N=500
Excellent job	1.4
Good	13.4
Fair	34.2
Poor	35.0
Don't know	16.0

59. First, are you familiar with Motor Vehicle Emissions Inspection Program?

	N=500
Yes	84.2
No	15.8

60. Before this interview, were you aware that the Motor Vehicle Emissions Inspection Program was a DEQE program

	N=421
Yes	10.2
No	89.8

61. Next, are you Familiar With Clean Lakes Program

	N=500
Yes	36.6
No	63.4

62. Before this interview, were you aware that the Clean Lakes Program was a DEQE Program?

	N=183
Yes	39.3
No	60.7

63. Are you familiar with the Hazardous Waste Site Cleanup Program?

	N=500
Yes	63.8
No	36.2

64. Before this interview, were you aware that the Hazardous Waste Program was a DEQE program?

	N=319
Yes	48.9
No	51.1

65. Are you familiar with the Water Pollution Control Program?

	N=500
Yes	47.0
No	53.0

66. Before this interview were you aware that the Water Pollution Control Program was a DEQE Program?

	N=235
Yes	47.2
No	52.8

67. Are you familiar with the Solid Waste Disposal Program?

	N=500
Yes	40.6
No	59.4

68. Before this interview, were you aware that the Solid Waste Disposal Program was a DEQE Program?

	N=203
Yes	48.8
No	51.2

69. Are you familiar with the Waste Water Treatment Program?

	N=500
Yes	45.6
No	54.4

70. Before this interview, were you aware that the Waste Water Treatment Program was a DEQE program?

	N=228
Yes	43.0
No	57.0

71. Are you familiar with the Acid Rain Monitoring Program?

	N=500
Yes	31.6
No	68.4

72. Before this interview, were you aware that the Acid Rain Monitoring Program was a DEQE Program?

	N=158
Yes	36.7
No	63.3

73. Are you familiar with the Water Management Program?

	N=500
Yes	28.2
No	71.8

74. Before this interview, were you aware that the Water Management Program was a DEQE Program?

	N=141
Yes	39.7
No	60.3

75. Are you familiar with the Wetlands Protection Program?

	N=500
Yes	55.2
No	44.8

75. Before this interview, were you aware that the Wetlands Protection Program was a DEQE Program?

	N=276
Yes	54.7
No	45.3

77. Are you familiar with the Community Composting Program?

	N=500
Yes	8.0
No	92.0

78. Before this interview, were you aware that the Composting Program was a DEQE Program?

	N=40
Yes	20.0
No	80.0

79. Are you familiar with the State Recycling Program?

	N=500
Yes	52.6
No	47.4

80. Before this interview, were you aware that the Recycling Program was a DEQE Program?

	N=263
Yes	21.3
No	78.7

81. Does your City-Town have a local recycling program?

	N=500
Yes	31.4
No	46.0
Don't know	22.6

82. Do you participate in any of the state or local Recycling Programs?

	N=500
Yes	22.0
No	77.6
Don't know	0.4

83. Are you aware that the DEQE Has Four regional offices throughout the State for dealing with environmental issues?

	N=500
Yes, aware	8.6
No, not aware	91.4

84. Would you like to see a Toll-Free Information Line established so that the DEQE can be easily contacted about environmental issues?

	N=500
Yes	83.4
No	12.0
Don't know	4.6

INTERVIEWER: Finally, I would like to ask you a few questions about you personally.

85. First, are you single, married, divorced, separated or widowed?

	N=496
Single	24.8
Married	54.8
Divorced	7.5
Separated	1.6
Widowed	11.3

86. What is the highest level of education you have received?

	N=500
Grade school	6.4
High school diploma	32.4
Some college	21.8
Technical school-junior college diploma	7.4
Four year college degree	20.4
Graduate degree	11.6

87. How old were you on your last birthday? (actual age recorded)

	N=500
18 to 24	12.6
25 to 34	26.2
35 to 44	23.8
45 to 54	10.6
55 to 64	10.4
65 and over	16.4

88. How many children under 6 live in your household?

	N=101
One	61.4
Two	33.7
Three	4.0
Four	1.0
Five or more	0.0

89. Last week, were you working full time, working part time, not working, keeping house, or were you in school?

	N=498
Working full time	54.4
Working part time	13.3
Not working	19.9
Keeping house	9.6
In school	2.8

90. Do you work for yourself, work for someone else, or do you work for the government?

	N=337
Self	19.9
Private company or individual	68.0
Government	12.2

91. Do you work for the federal government, the state government, or the local government?

	N=41
Federal government	22.0
State government	31.7
Local government	46.3

92. In what town do you live?

93. Which of these categories represents you total household income for 1988?

	N=439
Less than $10,000	11.6
10,000 to 14,999	6.2
15,000 to 19,999	7.5
20,000 to 24,999	9.8
25,000 to 29,000	10.5
30,000 to 34,999	9.1
35,000 to 39,000	8.7
40,000 to 49,999	8.2
50,000 to 59,999	9.8
60,000 or more	18.7

[The following variables are obtained either from the telephone exchange number or from the screening interview.]

Number of Adults Over 18 in Household (obtained in initial screening).

	N=500
One	41.6
Two	45.6
Three	7.4
Four	2.6
Five	2.0
Six to nine	0.2
Ten or more	0.6

County of Residence	N=500
Barnstable	2.8
Berkshire	2.4
Bristol	8.2
Dukes	0.2
Essex	11.0
Franklin	1.2
Hampden	7.6
Hampshire	2.4
Middlesex	23.4
Nantucket	0.2
Norfolk	10.4
Plymouth	7.4
Suffolk	11.4
Worcester	11.4

Sex	N=500
Male	45.0
Female	55.0